PHYSICS

BOOKS - CENGAGE PHYSICS

MAGNETISM

Mandatory Exercise Exercise Set I

1. You are provided with two similar bars - one is magnet and the other is just a bar of iron.

How will you distinguish between them without the use of any other magnet or bar?

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2. How do you test the polarity of a magnet?

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3. Can magnetic poles exist in isolation?

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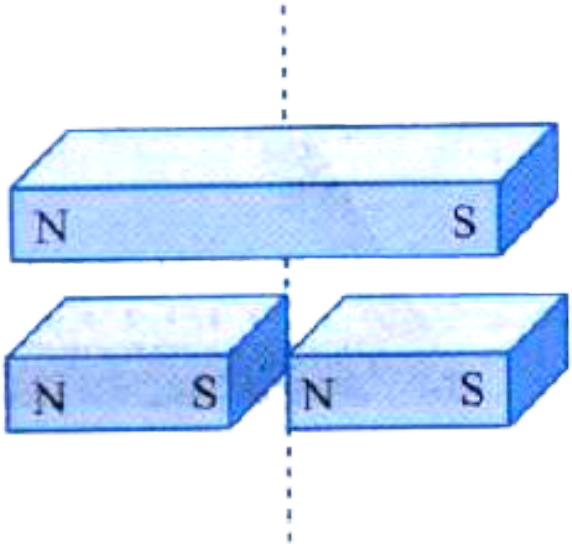
4. If a magnet is carefully broken into equal pieces along a line passing through its mid-point, how does the magnetic pole strength of each piece compare with that of the original magnet?



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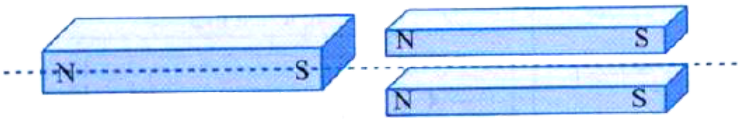
5. If a magnet is carefully broken into two halves along the axis as shown in the figure, how would the magnetic strength of each pole compare with the original magnet?



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6. Which of the following is not a magnetic material?

A. Steel

B. Cobalt

C. Iron

D. Manganese

Answer:

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7. Permanent magnets are made using

A. manganese

B. aluminium

C. steel

D. copper

Answer:

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8. Diamagnetic substances are those which orient themselves

A. along the direction of the external uniform field

B. along a direction opposite to the external uniform field

C. along any direction from stronger field regions to weaker field regions in a non-uniform field

D. none of the above

Answer:

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9. (a) What is a natural magnet?

(b) What is an artificial magnet?

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10. What are magnetic materials? List the properties of a magnet.

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11. How can we magnetize a piece of iron by electrical method?

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12. Electromagnets can be made by using

A. carbon steel

B. chromium steel

C. soft iron

D. tungsten steel

Answer:

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13. What are the two magnetic poles?

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14. What are magnetic materials? Give examples.

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15. What do you mean by magnetic induction?

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16. Write True/False:

The magnetism acquired by induction is temporary.

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17. Explain how a piece of iron is attracted towards a magnet.

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18. State the law of magnetic poles.

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19. What is magnetic length of a magnet?

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20. How does the magnetic length of a magnet compare to the geometric length of a magnet?

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21. Demagnetisation can be done by

A. heating

B. beating

C. hammering

D. all of these

Answer:

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22. Write down the Curie temperature for nickel and cobalt.

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23. Which of the following is a diamagnetic material?

A. iron

B. tungsten

C. nickel

D. silver

Answer:

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24. In the presence of a paramagnetic substance,

A. the applied field decreases

B. no change to applied field

C. applied field increases slightly

D. applied field increases strongly

Answer:

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25. The materials that are strongly magnetized in presence of external magnetic field are

A. diamagnetic material

B. paramagnetic material

C. ferromagnetic material

D. all of these

Answer:

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26. How can a small compass needle be used to map the magnetic field due to a bar magnet?

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27. Can two magnetic field lines of force intersect? Give reasons.

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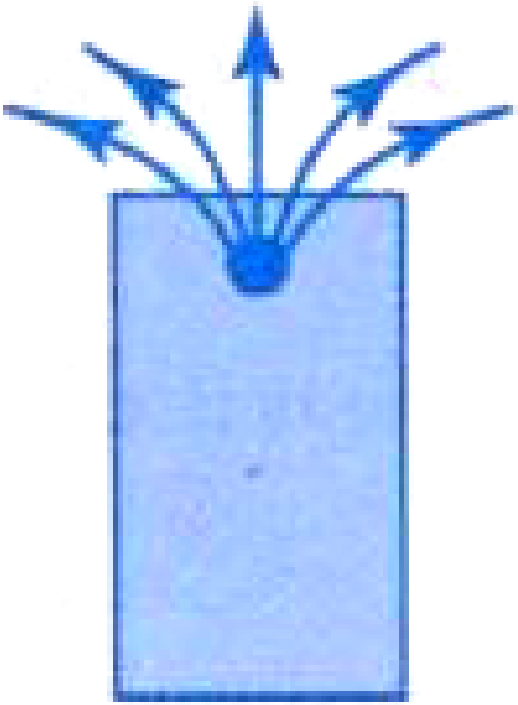
28. The figure shows a bar magnet held vertical on a plane paper. The sketch of the magnetic field lines is shown. Can you identify the poles of the magnet?



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29. How does a magnetic compass behave at a neutral point?

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30. Give evidences in support of the presence of earth's magnetic field.

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31. Where are the magnetic poles of the earth located?

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32. What are the elements that characterise the earth's magnetic field?

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33. In a small region, what is the general shape of the magnetic field lines of the earth?

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34. Which pole of a freely suspended magnet will move along magnetic field lines?

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35. Why do magnetic field lines always exist in close loops?

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36. How can we get the direction of magnetic field from magnetic field lines?

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37. Why are magnetic field lines crowded near the poles of the magnet?

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38. How can we represent uniform magnetic field with field lines?

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39. What is a non-uniform electric field?

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40. Write True/False:

The magnetic axis of the earth is exactly aligned with the geographic axis of the earth.

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41. What will be the orientation of a freely moving magnetic needle near the magnetic poles of the earth?

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42. What do you mean by magnetic equator?

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43. Does Mars have a magnetic field like Earth?

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44. What is declination?

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45. What is inclination or dip?

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46. Explain the horizontal and vertical components of earth's magnetic field.

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Mandatory Exercise Multiple Choice Questions With One Correct Answer

1. A magnetic field line is used to find the direction of

A. south-north

B. the compass needle

C. the poles of a magnet

D. magnetic field

Answer:

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2. At a neutral point, a compass needle shows

A. north-south direction

B. no particular direction

C. east-west direction

D. none of these

Answer:

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3. The dip at the poles is

A. 80°

B. 60°

C. 90°

D. 0°

Answer:

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4. The declination at a place is the

A. angle between horizontal and vertical axes

B. angle between geographic meridian and magnetic meridian

C. angle between the magnetic equator and the vertical line joining the poles

D. angle between the latitudes and longitudes

Answer:

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5. The earth's magnetic field is caused by the

A. circulation of liquid parts of the earth's core which results in electrical current

B. circulation of water within the earth's crust

C. presence of a huge bar magnet embedded inside the earth

D. earth's orbital motion

Answer:

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6. Magnetic field is a _____ quantity.

A. scalar

B. vector

C. tensor

D. none of these

Answer:

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Consolidated Exercise

1. Materials can be classified into the following categories:

A. diamagnetic

B. Paramagnetic

C. Ferro-magnetic

D. Electromagnet

Answer:

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2. Which of the following are properties of a magnet?

A. Attractive property

B. Repulsive property

C. Inductive property

D. Electrical property

Answer:

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3. Which of the following are types of magnets?

A. Bar magnet

B. Horse-shoe magnet

C. Electromagnet

D. Magnetic needle

Answer:

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4. Which of the following are diamagnetic materials?

A. Wood

B. Water

C. Iron

D. Magnesium

Answer:

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Olympiad And Ntse Level Exercises

1. A magnetic needle is placed on a cork floating in a still lake in the northern hemisphere. Does the needle togather with the cork move towards the north of the lake

A. Yes

B. No

C. May be or may not be move

D. Nothing can be said

Answer:

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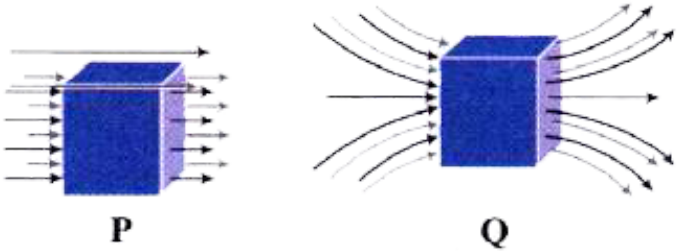
2. A uniform magnetic field, parallel to the plane of the paper existed in space initially directed from left to right. When a bar of soft iron is placed in the field parallel to it, the lines of force passing through it will be represented by



A. Figure (P)

B. Figure (Q)

C. Figure (R)

D. Figure (S)

Answer:

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3. The incorrect statement regarding the lines of force of the magnetic field B is

A. magnetic intensity is a measure of lines of force passing through unit area held normal to it

B. magnetic lines of force form a close curve

C. inside a magnet, its magnetic lines of force move from north pole of a magnet towards its south pole

D. due to a magnet magnetic lines of force never cut each other

Answer:

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4. The line on the earth's surface joining the points where the field is horizontal is

A. Magnetic meridian

B. Magnetic axis

C. Magnetic line

D. Magnetic equator

Answer:

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5. A ferromagnetic material is heated above its curie temperature. Which one is a correct statement?

A. Ferromagnetic domains are perfectly arranged

B. Ferromagnetic domains becomes random

C. Ferromagnetic domains are not influenced

D. Ferromagnetic material changes itself into diamagnetic material

Answer:

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6. A diamagnetic material in a magnetic field moves

A. from weaker to the stronger parts of the field

B. perpendicular to the field

C. from stronger to the weaker parts of the field

D. in none of these directions

Answer:

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7. Liquid oxygen remains suspended between two pole faces of a magnet because it is

A. diamagnetic

B. paramagnetic

C. ferromagnetic

D. antiferromagnetic

Answer:

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8. Read the assertion and reason carefully to mark the correct option.

Assertion: Magnetic resonance imaging (MRI)

is a useful diagnostic tool for producing images of various parts of human body.

Reason: Protons of various tissues of the human body play a role in MRI.

A. If both the assertion and reason are true and reason is a true explanation of the assertion

B. If both the assertion and reason are true both the reason is not the correct explanation of assertion

C. If the assertion is true but reason is false

D. If both the assertion and reason are false

Answer: