

Score: _____

School Name:: _____ School#: _____ JV _____ V _____

Names: _____

Shock Value Invitationals 2010

Multiple Choice (1 Pt. Each)

Identify the choice that best completes the statement or answers the question.

- _____ 1. As in the case of unlike magnetic poles, unlike electric charges
- attract each other.
 - repel each other.
 - exist in pairs.
 - do not interact.
- _____ 2. What causes charges to move in a circuit?
- voltage
 - energy
 - electricity
 - magnetism
- _____ 3. An electric current will always follow
- the path of least resistance.
 - a path toward the north pole.
 - a path toward the south pole.
 - the path that leads through insulators.
- _____ 4. According to Ohm's law, what is the resistance of a light if the voltage is 9.0 volts and the current is 0.30 amps?
- 0.033 ohms
 - 2.7 ohms
 - 30 ohms
 - 8.7 ohms
- _____ 5. In a series circuit with three bulbs,
- there are many paths for the current to take.
 - the remaining two bulbs are not affected if one bulb burns out.
 - all of the bulbs become dimmer as more bulbs are added.
 - a switch is never used.
- _____ 6. In a parallel circuit with three bulbs,
- the bulbs must all be located on the same branch.
 - there is only one path for the current to take.
 - current from each bulb has its own path.
 - the overall resistance increases if a new branch is added.

Name: _____

ID: A

- _____ 7. A connection that allows current to take the path of least resistance is called a
- short circuit.
 - series circuit.
 - parallel circuit.
 - grounded circuit.
- _____ 8. A complete, unbroken path through which electric charges can flow is a(n)
- electric circuit.
 - electrical resistance.
 - magnetic field line.
 - magnetic pole.
- _____ 9. An example of an insulator is
- rubber.
 - copper.
 - silver.
 - iron.
- _____ 10. A device used to open and close an electric circuit is a(n)
- light bulb.
 - energy source.
 - switch.
 - resistor.
- _____ 11. A device that transforms stored chemical energy into electrical energy is a(n)
- electrolyte.
 - electrode.
 - electrochemical cell.
 - terminal.
- _____ 12. The number of electromagnetic waves passing a given point each second is the
- frequency.
 - amplitude.
 - crest.
 - trough.
- _____ 13. Magnetic poles that are alike
- attract each other.
 - repel each other.
 - do not interact.
 - have the same shape.

Name: _____

ID: A

- _____ 14. The region around a magnet where the magnetic force is exerted is known as its
- magnetic pole.
 - lodestone.
 - magnetic field.
 - magnetic domain.
- _____ 15. A cluster of billions of atoms that all have magnetic fields lined up in the same way is known as a
- magnetic field line.
 - magnetic pole.
 - magnetic domain.
 - permanent magnet.
- _____ 16. An example of a common ferromagnetic material is
- plastic.
 - hydrogen.
 - nickel.
 - copper.
- _____ 17. Magnetic field lines around a bar magnet
- are only perpendicular to the magnet.
 - spread out from one pole and curve around to the other.
 - cross back and forth over one another.
 - are perfectly straight.
- _____ 18. Where is the magnetic pole in the Northern Hemisphere?
- at the geographic north pole
 - at the geographic south pole
 - along the coast of Antarctica
 - in northern Canada
- _____ 19. Streams of electrically charged particles flowing at high speeds from the sun make up the
- magnetosphere.
 - solar wind.
 - magnetic domain.
 - magnetic field.
- _____ 20. If you are in the Northern Hemisphere and see the Northern Lights, you are seeing
- an aurora.
 - a magnetic field.
 - the magnetosphere.
 - magnetic field lines.

Name: _____

ID: A

- _____ 21. Earth's magnetic field can make a magnet out of an iron bar by causing the magnetic domains to
- move back and forth between the north and south poles.
 - create magnetic field lines.
 - change the magnetic declination.
 - line up in the same direction.
- _____ 22. Magnetism can be considered a
- nuclear property.
 - physical property.
 - chemical property.
 - nonmetallic property.
- _____ 23. A spinning electron produces a(n)
- element.
 - magnetic field.
 - proton.
 - piece of iron.
- _____ 24. What is an electron?
- a particle that carries a negative charge
 - a particle that carries a positive charge
 - a particle that does not carry an electric charge
 - the smallest particle of an element that has the element's properties
- _____ 25. Every magnet, regardless of its shape, has two
- magnetic poles.
 - magnetic charges.
 - magnetic fields.
 - magnetic domains.
- _____ 26. What is one way you can destroy a magnet's magnetism?
- by putting it in water
 - by cooling it
 - by heating it
 - by breaking it into pieces
- _____ 27. A temporary magnet
- keeps its magnetism for a long time.
 - cannot be destroyed.
 - easily loses its magnetism.
 - has two north poles.

- _____ 28. What causes a compass to behave as it does?
- Earth's gravity
 - Earth's shape
 - Earth's geographic north pole
 - Earth's magnetic field
- _____ 29. Which type of energy is associated with electric currents?
- mechanical energy
 - electrical energy
 - magnetic energy
 - geothermal energy
- _____ 30. When a wire with a current is placed in a magnetic field,
- electrical energy is transformed into mechanical energy.
 - mechanical energy is transformed into electrical energy.
 - the wire becomes a permanent magnet.
 - the current stops.
- _____ 31. The process of generating an electric current from the motion of a conductor in a magnetic field is
- conduction.
 - induction.
 - motion.
 - magnetism.
- _____ 32. The type of current produced by a battery is
- direct current.
 - alternating current.
 - magnetic current.
 - induced current.
- _____ 33. What is produced when there is a current in the primary coil of a transformer?
- magnetic field
 - nuclear field
 - electric field
 - solar field
- _____ 34. An alternating current consists of charges that
- turn on and off repeatedly.
 - move back and forth in a circuit.
 - flow in one direction only.
 - flow in one direction in some devices and change direction in others.

Name: _____

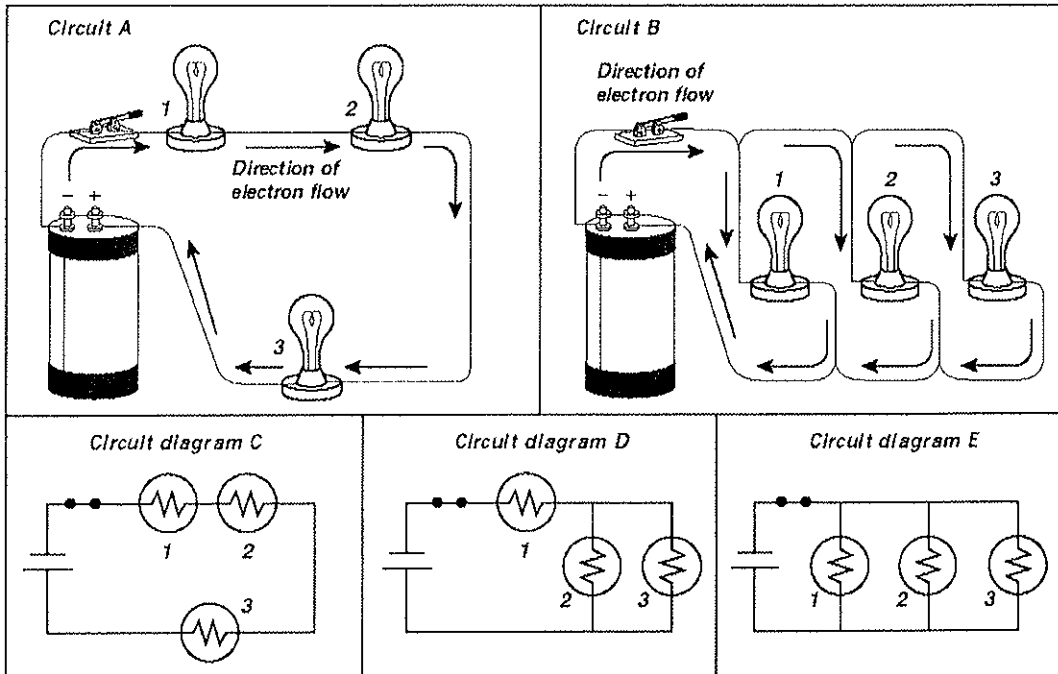
ID: A

- _____ 35. The relationship between electricity and magnetism is called
- current.
 - electromagnetism.
 - a solenoid.
 - voltage.
- _____ 36. Which is NOT a characteristic of a magnetic field produced by a current?
- It can be turned on and off.
 - Its direction can be reversed.
 - Its strength can be changed.
 - Its speed can be slowed.
- _____ 37. The ability to move an object over a distance is called
- electromagnetism.
 - electricity.
 - energy.
 - magnetism.
- _____ 38. What device transforms electrical energy into mechanical energy?
- an electromagnet
 - an electric motor
 - a generator
 - a solenoid
- _____ 39. Which is NOT a part of an electric motor?
- armature
 - brushes
 - commutator
 - slip ring
- _____ 40. What device increases voltage?
- generator
 - motor
 - step-down transformer
 - step-up transformer

Short Answer

Use the diagram to answer each question.

Series and Parallel Circuits

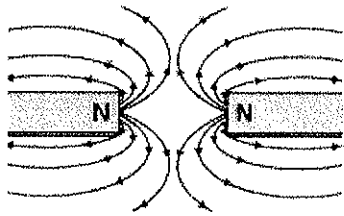
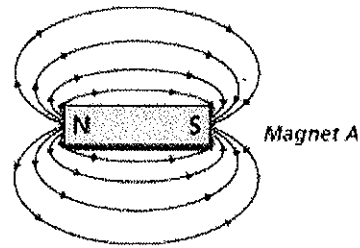


41. Which circuit—A or B—represents a series circuit? Explain your answer. _____

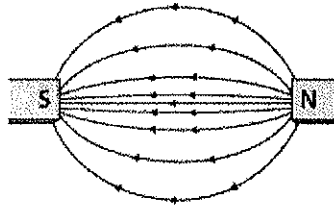
42. Which circuit—A or B—is a parallel circuit? Explain your answer. _____

43. Which circuit diagram represents circuit B? _____

Use the diagram to answer each question.



Magnet Pair B

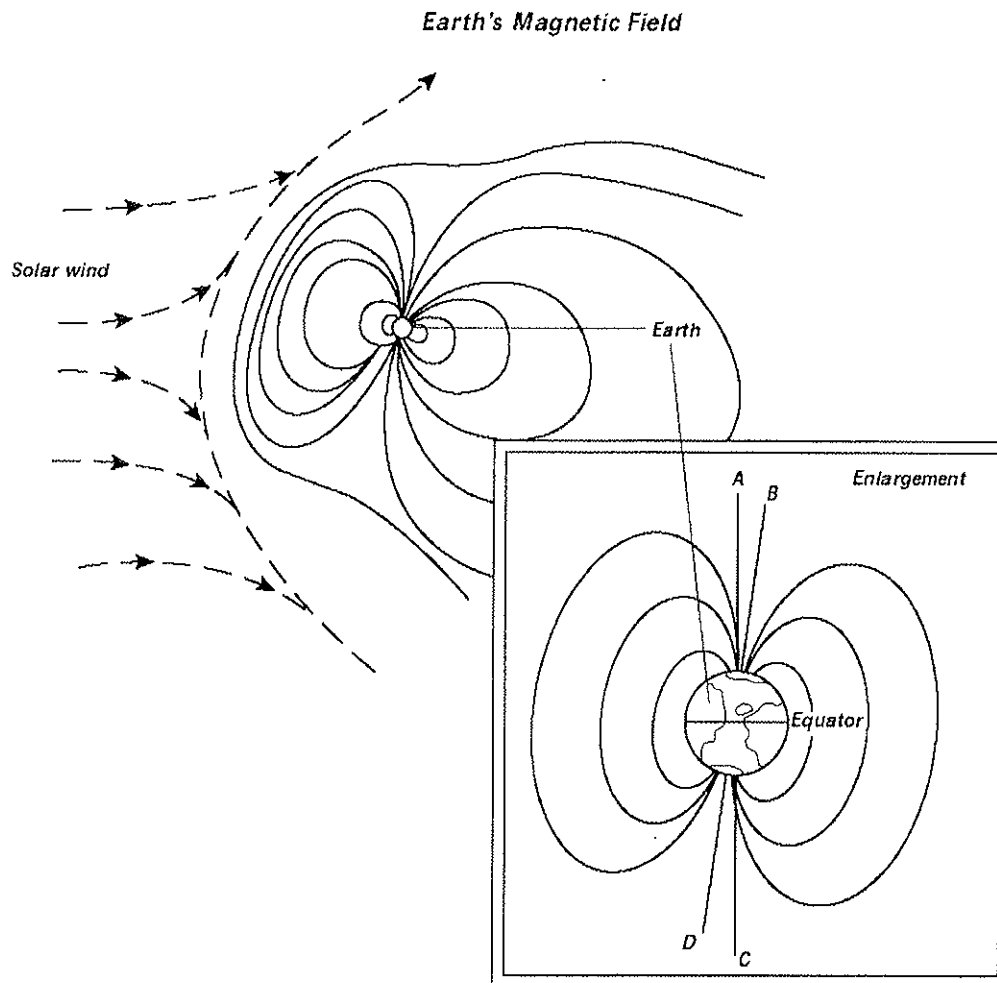


Magnet Pair C

44. What is each end of magnet A called? _____

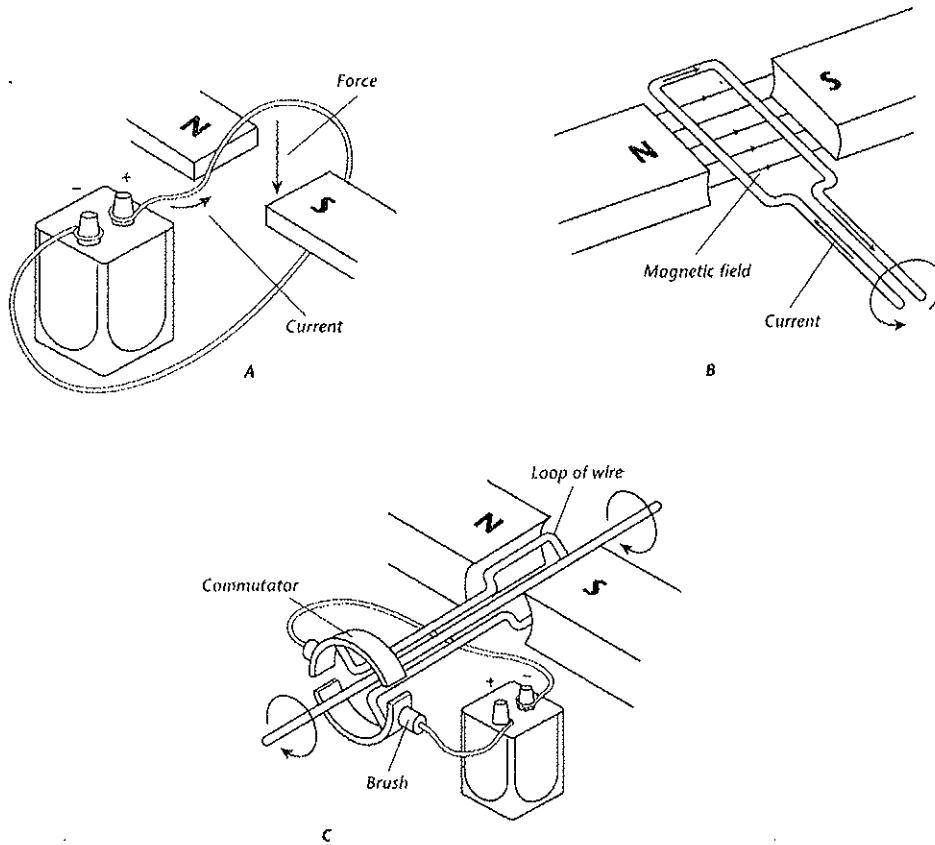
45. What is each curved line around magnet A called? _____

Use the diagram to answer each question.



46. In the enlargement in the diagram, what does point B represent? _____
47. What are the lines that spread out from one of Earth's poles and curve around the planet to return to the other pole? _____

Use the diagram to answer each question.

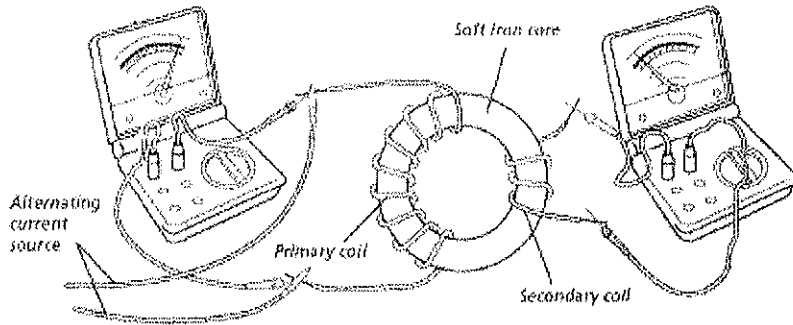


48. According to diagram A, in which direction will the upper loop of the wire move?

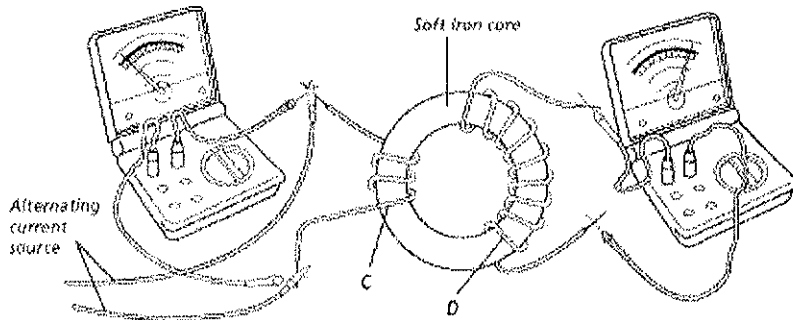
49. What common electrical device is shown in diagram C? _____

Use the diagram to answer each question.

Transformer A



Transformer B



50. What is induced in the secondary coils of the two transformers shown in the diagram?

Pg 1

Pg 2

Pg 3

Pg 4

Pg 5

 A 7.

 C 14.

 D 21.

 D 28.

 A 8.

 C 15.

 B 22.

 B 29.

 A 1.

 A 9.

 C 16.

 B 23.

 A 30.

 A 2.

 C 10.

 B 17.

 A 24.

 B 31.

 A 3.

 C 11.

 D 18.

 A 25.

 A 32.

 C 4.

 A 12.

 B 19.

 C 26.

 A 33.

 C 5.

 B 13.

 A 20.

 C 27.

 B 34.

 C 6.

Pg 6

B 35.

Pg 7

41. Circuit A

42. Circuit B

43. Circuit Diagram
E

D 36.

Page 10

48) Move downward

49) Electric Motor

Page 11

50) current

C 37.

44. Magnetic Pole

45. Magnetic Field
or
magnetic Field
Line

B 38.

Page 9

D 39.

46. Magnetic Pole

47. Magnetic Field
or
Magnetic Field
Lines

D 40.