Electricity

Talent & Olympiad

Electricity and Circuits

1. If we touch a live wire carrying current, we get a shock. This is because our body is a/an
(a) conductor of electricity.
(b) insulator of electricity.
(c) source of electricity.
(d) both (B) and (C).

2. Which of the following statements is true?
(a) Electricity can be created.
(b) Electricity flows in a circuit with gaps.
(c) A cell converts chemical energy to electrical energy.
(d) A cell consists of three terminals.

3. Most of the electricity carrying wires along the roads do not have a plastic covering like the wires used at homes. But why is there no substantial loss of energy?
(a) Air is not affected by gravity.
(b) Air is a bad conductor of electricity.
(c) Electricity flows very fast near highways.
(d) Current rating is high near highways.

4. What is the filament of an electric bulb ' usually made up of?
(a) A thin wire with many coils
(b) A thick wire with many coils
(c) A thin straight wire
(d) A thick straight wire

5. Electric heaters used for cooking have a filament or a heating co placed on a plate made up of clay. Why is this so?

(i) It is a bad conductor of heat. (ii) It is a bad conductor of electricity. (iii) It is porous.

(a) Only (i) and (ii) (b) Only (ii) and (iii)
(c) Only (i) and (iii) (d) (i), (ii) and (iii)

6. Why are the electric wires used in homes usually covered with materials like plastic or rubber?
(a) To prevent rusting
(b) To make handling easier
(c) To prevent shock and short circuits
(d) To make them look beautiful

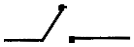
7. Why is a switch used in a circuit?
(a) To save energy
(b) To complete or break a circuit
(c) To prevent electric shocks
(d) To make the bulb glow easily

8. Which of the following does NOT conduct electricity?
(a) Aluminium
(b) Salt solution
(c) Ceramic articles
(d) Silver

9. Which of the following energy conversions take place in a torch?
(a) Electrical → chemical → light
(b) Chemical → electrical → light
(c) Electrical → light → chemical
(d) Light → chemical → electrical

10. It Why is tungsten used as a filament in electric bulbs?
(a) It is non-luminous.
(b) It is a soft metal.
(c) It has a high melting point.
(d) It has a low melting point.

11. Which metal is used for making electric wires?
(a) Graphite (b) Iron
(c) Copper (d) Zinc

12. Identify the symbol of a fuse.
(a)  (b) 
(c)  (d) 

13. In a circuit with one bulb, another bulb is added in series. What happens to the bulbs when current is passed?
(a) They do not glow.
(b) They glow less brightly.
(c) They glow more brightly.
(d) They get fused.

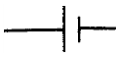
14. Why is it unsafe to switch on a bulb with wet hands?
(a) It can give a shock.
(b) The bulb gets fused.
(c) The switch blows off.
(d) The wires are disconnected.

15. Nidhi connected two bulbs across two cells in a simple circuit. What should Nidhi do to make the bulbs glow dimmer?
(a) Replace one cell with a piece of chalk
(b) Replace one cell with a piece of wire
(c) Replace one bulb with a piece of wire
(d) Replace one bulb with another cell

16. What are the two places on a battery to which the wires can be attached called?
(a) Switches (b) Filaments
(c) Terminals (d) Insulators

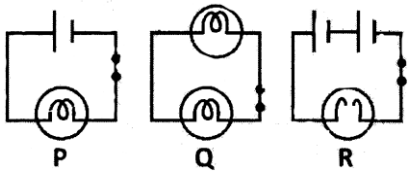
17. What happens to a circuit when the switch is in the OFF position?
(a) The circuit is complete.
(b) There is a gap in the circuit.
(c) Electricity flows continuously.
(d) Electricity flows intermittently.

18. Which of the following does NOT belong to the group formed by the others?
(a) Iron
(b) Tin
(c) Glass
(d) Steel

19. Which of the following statements is incorrect7
(a) A dry cell produces a small amount of electrical energy.
(b) A dry cell is used in TV remotes.
(c) All dry cells are rechargeable.
(d) The symbol of a dry cell is 

20. In which of these circuits will the bulb or bulbs glow the brightest?
(a) A simple circuit with one bulb and one cell
(b) A simple circuit with one bulb and two cells
(c) A simple circuit with two bulbs and one cell
(d) A simple circuit with two bulbs and two cells

21. Identify the circuit diagram in which the bulb does NOT light up.

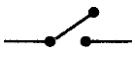


(a) Only P and Q
(b) Only Q and R
(c) Only R and P
(d) P, Q and R

22. Which of the following cannot be used in electrical wires?
(a) Copper
(b) Silver
(c) Aluminium
(d) Iron

23. A cell, a conducting wire and a bulb are used for constructing a simple electric circuit. What are they called?
(a) Consumers
(b) Connectors
(c) Components
(d) Sources

24. Which components are required to make a simple electric circuit to light a bulb?
(a) Wires and a switch
(b) A cell and a switch
(c) A bulb and wires
(d) Wires, a cell, a bulb and a switch.

25. Which of the following is the symbol of an electric bulb?
(a) 
(b) 
(c) 
(d) 

26. Why is copper NOT used as a filament?
(a) It produces white light.
(b) It has a high melting point.
(c) It is a good conductor of current.
(d) It produces heat.

27. Which one of the following is the correct grouping of different materials according to their electrical conductivity?

	Electrical Insulators	Electrical Conductors
(a)	Plastic/wood	Mercury, tungsten
(b)	Carbon, steel	Iron, paper
(c)	Copper, gold	Nickel, clay
(d)	Iron, rubber	Silver, plastic

28. Why do electricians wear gloves made of rubber?
(a) It is soft.
(b) It is water proof.
(c) It is an insulator.
(d) It is inexpensive.

29. Which of these are good electrical insulators?
(a) Graphite, wood, rubber
(b) Rubber, glass, wood
(c) Pure water, wood, silver
(d) Copper, iron, silver

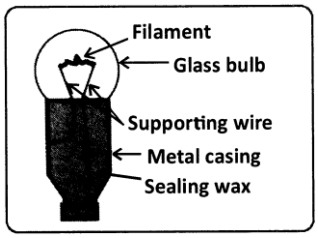
30. Which of these will generate electric current when kept in sunlight but not in the dark?
(a) Dry cell
(b) Car battery
(c) Button cell
(d) Solar cell

31. Why doesn't a bulb glow even if the correct connections are made?

(i) Battery is dead.
(ii) Filament is broken.
(iii) Switch is closed.

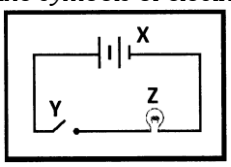
(a) Only (i)
(b) Only (ii)
(c) Only (iii)
(d) Only (i) and (ii)

32. Look at the figure shown below.



Why is sealing wax filled in the space between the terminals of a bulb?
(a) To prevent the escape of air inside the bulb
(b) To prevent the contact between the two terminals
(c) To have a better contact of terminals with one another
(d) To give support to the supporting wires holding the filament

33. Identify the symbols of electrical components used in the construction of the given electric circuit.

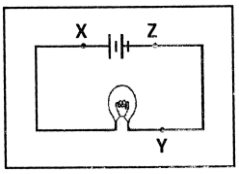


	X	Y	Z
(a)	Switch	Cell	Bulb
(b)	Battery	Cell	Bulb
(c)	Battery	Switch	Bulb
(d)	Switch	Cell	Battery

34. The bulb in a circuit glows when electric current
(a) flows through its filament.
(b) flows through the glass covering.
(c) stops flowing to the bulb.
(d) flows into the air through the bulb.

35. What does a battery contain?
(a) A minimum of two terminals
(b) A minimum of three terminals
(c) A cell and a switch
(d) A bulb and a switch

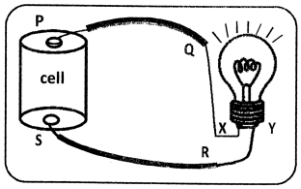
36. The figure shows an electric circuit made up of a battery and a bulb.



37. Which of the following is the correct sequence of the directions of current at X, Y and Z?

	X	Y	Z
(a)	↑	↓	↑
(b)	↓	↑	↓
(c)	→	←	→
(d)	←	→	←

38. Look at the circuit given below.

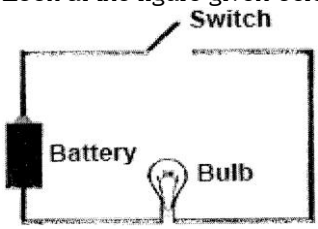


It consists of a cell, a bulb with two terminals X, Y and wires. P, Q, R and S are positions marked. What is the direction of the flow of current?
(a) PQRS (b) PSRQ
(c) PRQS (d) SQRP

39. What is the source of electricity in the satellites?
(a) Dry cells (b) Dynamos
(c) Solar cells (d) Accumulators

40. Tube lights are preferred to bulbs mainly because
(a) bulbs give more light.
(b) bulbs are cheaper.
(c) bulbs get fused easily/frequently.
(d) bulbs produce shadows.

41. Look at the figure given below.



What do you observe when the switch is closed?
(a) The bulb lights up.
(b) Electrical energy is converted into sound energy.
(c) The bulb does not glow.
(d) Light energy is converted into heat energy.

Answers and Solution

1. (a) Human body is a good conductor of electricity. So, the current passes through it and gets earthed. and gives us a shock in the process.

2. (c) A cell has chemicals m it. It converts chemical energy to electrical energy.

3. (b) Air is a bad conductor of electricity. Hence, there is no substantial loss of energy during the flow of electricity in the overhead electric wires along the road.

4. (a) The filament of an electric bulb is usually made up of a thin wire with many coils.

5. (a) Clay is a bad conductor of heat and electricity. In order to avoid shock due to the flow of current and also to avoid the instrument getting heated, a clay stand is used to place the coil or filament.

6. (c) Electric wires used in homes generally have a plastic or rubber covering so as to prevent shocks when we touch them. Insulation also prevents the two live wires coming in contact causing a short circuit.

7. (b) A switch is used to complete or break a circuit.

8. (c) Ceramic articles do not conduct electricity.

9. (b) A torchlight is powered by dry cells which convert chemical energy to electrical energy. This in turn, is converted into light energy by the torch light.

10. (c) Tungsten has a high melting point. Hence, it is used as a filament in electric bulbs.

11. (c) Copper is used for making electric wires.

12. (a) The symbol of a fuse is 

13. (b) A circuit has one bulb, if another bulb is connected in series, the brightness of the two bulbs will be less than the brightness with which the single bulb was glowing earlier.

14. (a) It is unsafe to switch on a bulb with wet hands because it can give a shock.

15. (b) The amount of current produced by two cells is more as compared to a single cell.
Thus, when a cell is replaced in a circuit with a wire, the bulbs glow dimmer.

16. (c) Wires in a circuit are connected to the two terminals called the positive and the negative terminals.

17. (b) When a switch in the circuit is in the OFF position, there is a gap (or discontinuity) in the circuit which does not allow flow of electricity in the circuit.

18. (c) Iron, tin and steel are all metals and good conductors of heat and electricity. Glass is a bad conductor of heat and electricity.

19. (c) Only some dry cells are not rechargeable.

20. (b) A simple circuit with one bulb and two cells glows the brightest.

21. (b) In circuit P $\rightarrow$ The bulb glows as it is a complete circuit.
In circuit Q $\rightarrow$ There is no cell and so no current flows to light up the bulb.
In circuit R $\rightarrow$ The filament is broken in the bulb. So, the bulb does not light up.

22. (d) All the given metals are good conductors of electricity. But, iron cannot be used in electrical wires because it is brittle and corrodes when it comes in contact with the oxygen in the air.

23. (c) A cell, a conducting wire, and a bulb are called the components of an electric circuit.

24. (d) A simple electric circuit consists of connecting wires/a cell/a bulb and a switch.

25. (b) The symbol of an electric bulb is shown below.

26. (c) Copper cannot be used as a filament because it is a good conductor of current.

27. (a) Electrical insulators are plastic, wood, paper, clay, rubber, etc.
Electrical conductors are metals like mercury, tungsten, steel, nickel, carbon, copper and gold.

28. (c) Gloves used by electricians are made of rubber which is an insulator.

29. (b) Rubber, glass and wood are good electrical insulators.

30. (d) A solar cell can generate electric current when kept in sunlight but not when kept in the dark.

31. (d) If a battery is dead, the bulb does not get the supply of energy. So, the bulb does not glow. If the filament is broken in the bulb, it does not glow. But if a switch is closed, then the bulb glows as current flows through the circuit.

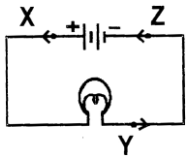
32. (b) The reason for filling the space between the terminals of the bulb with sealing wax is to prevent the contact between the two terminals.

33. (c) The symbols of electrical components used in the construction of the given circuit are X - Battery, Y - Switch, Z - Bulb.

34. (a) The bulb in a circuit glows when electric current flows through the filament of the bulb.

35. (a) A battery contains a minimum of two terminals.

36. (f) Conventional flow of current is from the positive to the negative terminal of a battery as shown below.



37. (a) In an electric circuit/the direction of flow of current is from the positive terminal to the negative terminal of the cell PQRS.

38. (c) Solar energy can be used directly by solar cells to produce electricity for use in satellites.

39. (d) Bulbs produce large umbral shadows when compared to tube lights. Hence, tube lights are preferred to bulbs.

40. (a) When the switch is closed, electrical energy flows through the wires to the bulb which lights up.