* Choose the correct alternative from those given below each questions [33]

1. Which circuit is complete?

(A) Open (B) Closed (C) Broken (D) Switched OFF

Ans. : (B) Closed

2. What is used to turn current ON or OFF ?

(A) Wire (B) Battery (C) Switch (D) Plug

Ans. : (C) Switch

3. What is the purpose of insulation on wires?

(A) Decoration (B) Protect from shocks

(C) Attract electricity (D) Help conduct

Ans. : (B) Protect from shocks

4. The longer wire in an LED is:

(A) Negative (B) Positive

(C) Either (a) or (b) (D) Neither (a) nor (b)

Ans. : (B) Positive

5. What flows in a circuit?

(A) Water (B) Current (C) Heat (D) Light

Ans. : (B) Current

6. Which is a correct pair?

(A) LED - Filament (B) Battery - Insulator

(C) Cell - Energy source (D) Switch - Earth wire

Ans. : (C) Cell - Energy source

7. A symbol helps in:

(A) Confusing learners (B) Shortening circuit explanation

(C) Making the circuit large (D) Breaking it

Ans. : (B) Shortening circuit explanation

8. Which of these is an insulator?

(A) Iron (B) Plastic (C) Copper (D) Aluminium

Ans. : (B) Plastic

9. Which of these completes an electric circuit?

(A) Insulator (B) Air gap

(C) Switch in ON position (D) Fused bulb

Ans. : (C) Switch in ON position

10. Which part of a torch glows?

(A) Battery (B) Filament (C) Switch (D) Holder

Ans. : (B) Filament

11. The electric cell has how many terminals?

(A) One (B) Two (C) Three (D) Four

Ans. : (B) Two

12. The filament in a bulb glows due to:

(A) Sound (B) Air

(C) Heat generated by electric current (D) Light

Ans. : (C) Heat generated by electric current

13. Which terminal of the electric cell is a flat metal disc?

(A) Positive (B) Negative (C) Both of these (D) None of these

Ans. : (B) Negative

14. In an LED, the longer leg is:

(A) Negative terminal (B) Neutral (C) Positive terminal (D) Inactive

Ans. : (C) Positive terminal

15. What happens when an LED is connected in reverse?

(A) It glows brighter (B) It breaks (C) It does not glow (D) It glows dimly

Ans. : (C) It does not glow

16. Which energy source is used at Bhakra Nangal Dam?

(A) Wind (B) Coal (C) Water (D) Sunlight

Ans. : (C) Water

17. Electric wires are covered with:

(A) Metal (B) Iron (C) Plastic (D) Glass

Ans. : (C) Plastic

18. Which of the following is essential to complete a circuit?

(A) Air (B) Insulator (C) Conductor (D) Magnet

Ans. : (C) Conductor

19. What does a switch do in an electric circuit?

(A) Changes direction of current (B) Increases voltage

(C) Connects or disconnects the circuit (D) Stores electric energy

Ans. : (C) Connects or disconnects the circuit

20. Why does a fused bulb not glow?

(A) It has no filament (B) Its glass is broken

(C) The filament is broken (D) It has no base

Ans. : (C) The filament is broken

21. Which of these components emits light containing a filament?

(A) Incandescent bulb (B) LED

(C) Fluorescent tube (D) Switch

Ans.: (A) Incandescent bulb

22. Why are rubber and plastic used in electric wires?

(A) They are colourful (B) They are conductors

(C) They are insulators (D) They are flexible metals

Ans. : (C) They are insulators

23. In a circuit diagram, the symbol "—| |—" represents:

(A) A battery (B) A switch (C) A resistor (D) A cell

Ans. : (D) A cell

24. Choose the incorrect, statement.

(A) A switch is the source of electric current in a circuit.

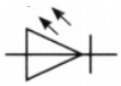
(B) A switch helps to complete or break the circuit.

(C) A switch helps us to use electricity as per our requirement.

(D) When the switch is in 'OFF' position, there is an air gap between its terminals.

Ans.: (A) A switch is the source of electric current in a circuit.

25.

Column I	Column II
Q.1. Electric cell	A. 
Q.2. Battery	B.
Q.3. LED	C. 
Q.4. Wire	D. 

(A) (1)-C, (2)-A, (3)-D, (4)-B (B) (1)-A, (2)-B, (3)-C, (4)-D

(C) (1)-D, (2)-C, (3)-B, (4)-A (D) (1)-B, (2)-D, (3)-A, (4)-C

Ans. : self

26. Which of the following is a basic component of an electric circuit?

(A) Light bulb (B) Battery (C) Switch (D) All of the above

Ans. : self

27. The flow of electric current in a circuit is caused by:

(A) Batteries (B) Conductors

(C) Switches (D) None of the above?

Ans. : self

28. Which of the following materials is a good conductor of electricity?

(A) Plastic (B) Wood (C) Copper (D) Rubber

Ans. : self

29. What is the function of a switch in a circuit?

(A) To increase the current (B) To decrease the voltage

(C) To control the flow of current (D) To provide energy to the circuit

Ans. : (C) To control the flow of current

30. Which of the following components is used to store electrical energy?

(A) Battery (B) Switch (C) Wire (D) Bulb

Ans.: (A) Battery

31. What does the symbol of a resistor look like in an electrical circuit diagram?

(A) A zigzag line (B) A circuit with a cross inside

(C) A rectangle (D) A straight line

Ans.: (A) A zigzag line

32. In an electric circuit, what happens when the switch is in the 'OFF' position?

(A) The circuit is open, and no current flows

(B) The circuit is closed, and current flows

(C) The bulb lights up

(D) The battery gets charged

Ans.: (A) The circuit is open, and no current flows

33. When a switch is in the 'OFF' position:

(i) Oil from water

(ii) Sand from water

(iii) Cream from milk

(iv) Oxygen from air

Choose the combination of correct answers from the following:

(A) All are correct

(B) (ii) and (iii) are correct

(C) Only (iv) is correct

(D) Only (i) and (ii) are correct

Ans. : (B) (ii) and (iii) are correct

*** a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.** **[8]**

34. Assertion (A): A circuit diagram uses symbols of electrical components.
Reason (R): It is easier to draw and understand electric circuits by using symbols.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans.: (A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

35. Assertion (A): LED glows only when current flows in one direction.
Reason (R): It is unidirectional in nature.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans.: (A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

36. Assertion (A): A filament in an incandescent lamp is made of tungsten.
Reason (R): Tungsten filaments glow because they resist current and produce heat.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans.: (A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

37. Assertion (A): The electric cell has two different terminals to allow current to flow.
Reason (R): Current flows from lower to higher potential in a closed circuit.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans. : (C) (A) is true, but (R) is false.

38. Assertion (A): LED lamps are more efficient than filament bulbs.
Reason (R): LEDs emit light without generating much heat.

(A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

(B) Both Assertion (A) and Reason (R) are true, but (R) is not the correct explanation of (A).

(C) (A) is true, but (R) is false.

(D) (A) is false, but (R) is true.

Ans.: (A) Both Assertion (A) and Reason (R) are true, and (R) is the correct explanation of (A).

39. Assertion (A): The flow of electric current in a circuit requires a complete path.
Reason (R): If the circuit is incomplete, current will not flow.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true

Ans. : self

40. Assertion (A): A battery is used to power an electrical circuit.
Reason (R): A battery provides a source of voltage to move electrons through the circuit.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true, but R is false.

(D) A is false but R is true.

Ans.: (A) Both A and R are true and R is the correct explanation of A.

41. Assertion (A): The switch in a circuit is used to control the flow of electricity.
Reason (R): The switch opens or closes the circuit to either allow or stop the flow of current.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true, but R is false.

(D) A is false but R is true.

Ans.: (A) Both A and R are true and R is the correct explanation of A.

*** State Whether The Following Sentences Are True Or False.[1 Marks Each]** **[10]**

42. Electric current flows only in a closed circuit.

Ans. : true

43. Plastic is a good conductor of electricity.

Ans. : false

44. A battery can be made by connecting cells randomly.

Ans. : false

45. LED has two terminals.

Ans. : true

46. An open switch allows electricity to flow.

Ans. : false

47. All electric lamps have a filament.

Ans. : false

48. Circuit diagrams use real objects.

Ans. : false

49. Glass is a good conductor.

Ans. : false

50. A fused bulb has a broken filament.

Ans. : true

51. Metals are good conductors of electricity.

Ans. : true

*** Fill In The Blanks With Correct Alternative.[1 Marks Each]** **[16]**

52. The glowing part of a bulb is called _____.

Ans. : filament

53. A _____ allows or stops current flow.

Ans. : switch

54. Circuit diagrams use _____ to represent components.

Ans. : symbols

55. _____ is a good conductor used in wires.

Ans. : Copper

56. An _____ is a portable source of electricity.

Ans. : electric cell

57. An LED must be connected in _____ direction.

Ans. : correct

58. A wire made up of _____ does not conduct electricity.

Ans. : rubber

59. The symbol  represents an electric _____.

Ans. : terminal

60. An electric circuit is used to obtain _____ .

Ans. : self

61. The metal case at the base of a lamp is connected to the _____ terminal.

Ans. : self

62. The human body is a _____ of electricity.

Ans. : self

63. The combination of two or more cells is called _____ .

Ans. : a battery

64. The bulb will glow in a circuit only when the switch is in the _____ position.

Ans. : closed

65. If the switch is in the _____ position, the bulb will not glow.

Ans. : open

66. When cells are connected in a circuit, they form a _____ .

Ans. : battery

67. The switch in a circuit is used to control whether the circuit is _____ or _____ .

Ans. : open, closed

*** Answer The Following Questions In One Sentence.[1 Marks Each]** **[37]**

68. What happens if the filament breaks?

Ans. :

If the filament in an incandescent lamp breaks, it creates a gap in the circuit.This gap stops the flow of electric current.

69. Name the component that connects or breaks the flow of electricity.

Ans. : The component that connects or breaks the flow of electricity in a circuit is called a switch.

70. What is the purpose of using a cell holder in a circuit?

Ans. : A cell holder helps to connect and hold the cell properly in a circuit.

71. Which terminal of a cell is connected to the longer wire of an LED?

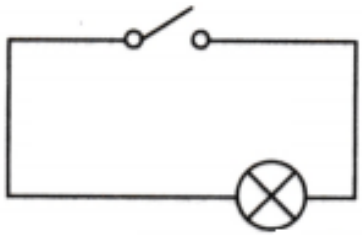
Ans. : The positive (+) terminal of the cell should be connected to the longer wire of the LED.

72. What does the filament in an incandescent lamp do when electricity passes through it?

Ans. : When electricity passes through the filament, it gets very hot. This heat causes the filament to glow, producing light.

73. Draw a circuit diagram for a simple torch using symbols for electric components.

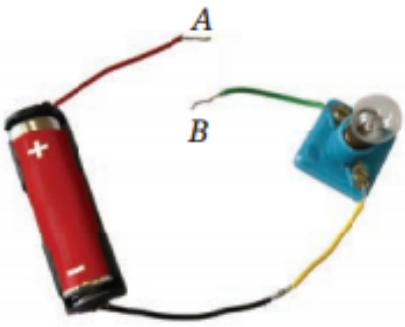
Ans. :



74. In a torch, we generally use more than one cell. Are those placed in any particular order?

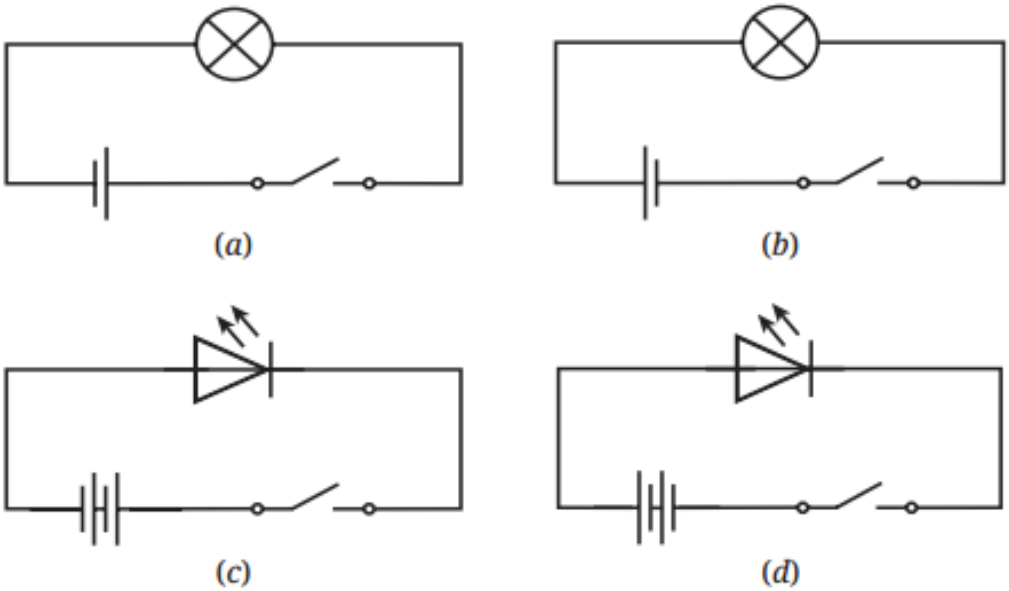
Ans. : Yes, in a torch, cells are usually placed in series. The positive terminal of one cell is connected to the negative terminal of the next. This arrangement increases the total voltage, which powers the lamp.

75. Observe Fig. With which material connected between the ends A and B, the lamp will not glow?



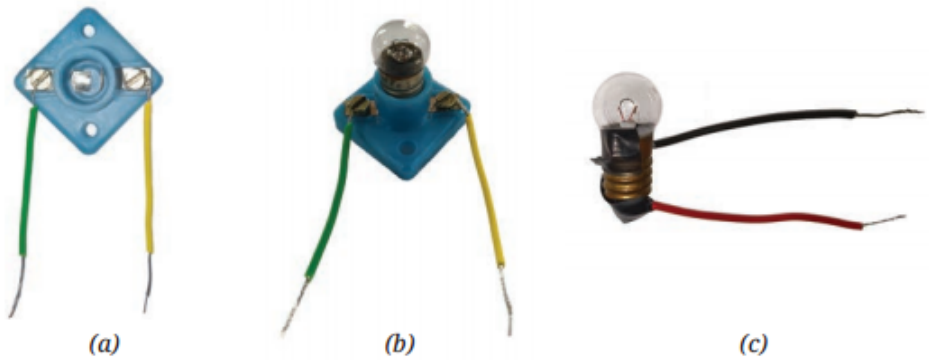
Ans. : To prevent the lamp from lighting in Fig., connect an insulator (like rubber or plastic) between A and B. This will break the circuit and stop the flow of electricity.

76. In Fig., in which case(s) the lamp will not glow when the switch is closed?



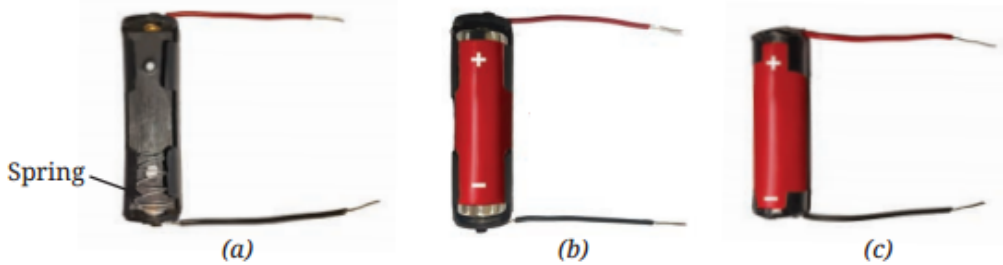
Ans. : Case (a): The Lamp will glow.
Case (b): Lamp will not glow.
Case (c): Lamp may not glow if the battery is reversed.
Case (d): Lamps will glow.

77. Observe the fig.



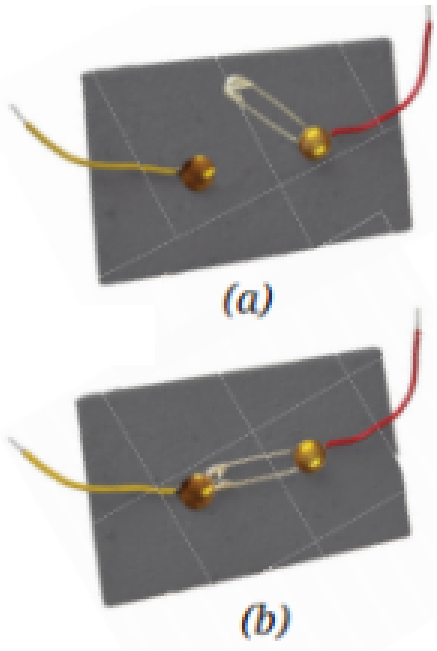
Ans. : Fig. (a) An electric cell holder with two wires attached
(b) An electric cell inside the cell holder
(c) Wires connected to an electric cell using electrical tape

78. Observe the fig.



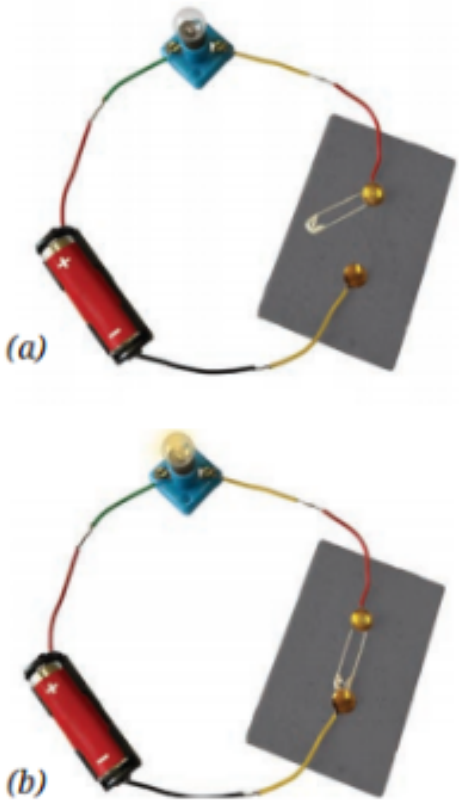
Ans. : Fig. (a) An electric lamp holder with wires attached
(b) An incandescent lamp inside the lamp holder
(c) Wires connected to incandescent torch lamp with electrical tape

79. Observe the fig.



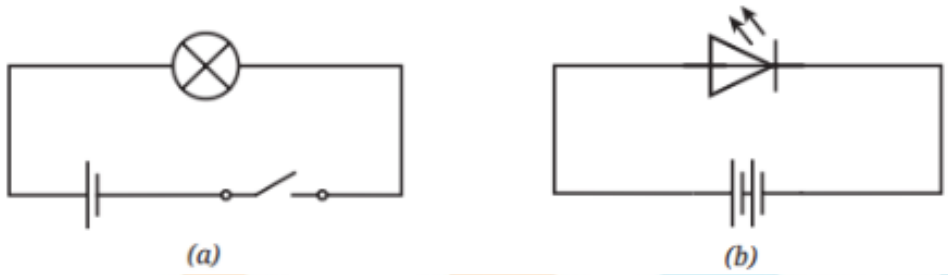
Ans. : Observation and conclusion: We constructed a simple switch using a safety pin and drawing pins on a cardboard piece. When connected with wires, this setup works as a basic switch that can open or close a circuit.

80. Observe the fig.



Ans. : Observation and conclusion: By connecting the switch to a battery and lamp, we saw that the lamp glows only when the safety by opening or closing the path.

81.



Ans. : Observation and conclusion: The circuit diagram can be drawn easily with the help of symbols of different electric components.

82. What do you mean by an electric circuit?

Ans. : The path through which electric charges move from one point to another is called an electric circuit.

83. Name some components of an electric circuit.

Ans. : Battery, wire, key, and bulb are the components of a simple electric circuit.

84. In which position is the key placed in a circuit?

Ans. : A key can be placed anywhere in the circuit.

85. What is the symbol of a battery?

Ans. : The symbol of a battery consists of two or more cells connected in series.

86. Which part of the symbol of a battery shows positive and negative terminals?

Ans. : The longer line represents the positive terminal, and the shorter line represents the negative terminal of the battery.

87. What is a battery?

Ans. : When two or more cells are joined together, it is called a battery.

88. How can we connect the cells to prepare a battery?

Ans. : The positive terminal of one cell is connected to the negative terminal of the next cell to prepare a battery.

89. What do you mean by a closed circuit?

Ans. : A closed circuit means the switch is in the 'ON' position, and the current can flow through the circuit.

90. What do you mean by an open circuit?

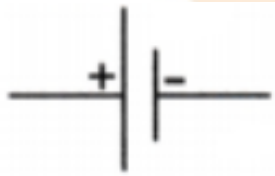
Ans. : An open circuit means the switch is in the 'OFF' position, interrupting the flow of current.

91. Does the bulb glow when the circuit is open?

Ans. : No, the bulb does not glow when the circuit is open.

92. Draw the symbol of the following circuit component : electric cell

Ans. :



93. Draw the symbol of the following circuit component : Switch in 'OFF' position

Ans. :

94. Draw the symbol of the following circuit component : electric bulb

Ans. :

95. Draw the symbol of the following circuit component : battery

Ans. :

96. What is the portable source of electrical energy called?

Ans. : Electric cell

97. What is formed when two or more electric cells are connected?

Ans. : Battery

98. What is the thin wire inside an incandescent lamp called?

Ans. : Filament

99. Which device is used to control the flow of electric current in a circuit?

Ans. : Switch

100. What do we call a circuit where electric current flows?

Ans. : Closed circuit

101. What material is commonly used to make electrical wires?

Ans. : Copper

102. Which material does not allow electric current to pass through?

Ans. : Insulator

103. What is the symbol for a battery in a circuit diagram?

Ans. :

104. What is the name of the device used in torches that provides light?

Ans. : LED/Bulb

*** consists of questions of 2 marks each.** **[106]**

105. Why should we not touch electrical appliances with wet hands?

Ans. : It's very dangerous to touch electrical appliances with wet hands because water is a good conductor of electricity. When your hands are wet, they provide an easy path for electric current to flow through your body. If you touch a faulty appliance or a live wire with wet hands, the electricity can pass through you, causing a severe electric shock.

106. Define an electric circuit and give symbols of two electrical components.

Ans. : An electric circuit is a closed pathway for electric current to flow.

Electrical Components Symbols:

(1) **Electric Cell:** + -

(2) **Switch (ON position):** --o--

107. List two differences between conductors and insulators.

Ans. :

Feature	Conductors	Insulators
Electrical Current	Allow electric current to pass easily.	Resist the flow of electric current.
Electron Behavior	Have free electrons that can move and carry electric charge.	Have electrons that are tightly bound and cannot move freely.

108. What happens if you connect a cell in reverse in a torch?

Ans. : If we put a cell in a torch backward, the torch lamp will not glow.The electric current needs to flow in the correct direction for the circuit to work. Reversing the cell breaks this flow.

109. What is the role of a filament?

Ans. : The filament is a thin wire inside an incandescent light bulb that gets very hot when electricity passes through it.This heat causes the filament to glow, producing light. So, the filament's main job is to convert electrical energy into light energy.

110. Explain what happens when the switch is OFF.

Ans. :

When the switch is in the OFF position, it creates a gap in the circuit.This gap prevents the electric current from flowing through the circuit. As a result, the circuit is incomplete or open, and any electrical component (like a bulb) connected in the circuit will not function.

111. Why is it important to use correct symbols in circuit diagrams?

Ans. : Using the correct symbols in circuit diagrams is essential because these diagrams serve as a universal language for electrical and electronic circuits. Just like a map uses specific symbols to represent different landmarks, circuit diagrams use standardized symbols to represent components like resistors, capacitors, voltage sources, and transistors.

112. Predict what will happen if all wires used in homes are made of plastic.

Ans. : Plastic is an insulator. If all the wires in your home were made of plastic, electricity would not be able to flow through them.Since electricity couldn't reach your lights, appliances, or other devices, nothing would work.

113. Imagine a world without electricity. How would it affect communication?

Ans. : Without electricity, modern communication would be impossible. There would be no mobile phones, computers, or internet, so we would have to rely on slower methods like postal services and messengers. News and information would spread slowly with no television or radio, and emergency services would struggle to respond quickly, severely limiting global connectivity and making communication slower and less reliable.

114. You used two cells in a torch but it does not work. What could be wrong?

Ans. : The torch might not work due to incorrect cell placement, where the positive and negative ends aren't properly aligned.

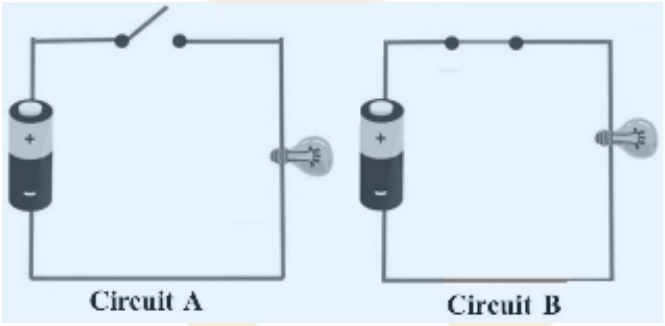
115. A student used silk fibre for his circuit. Will it work? Why?

Ans. : No, silk fiber will not work.
This is because silk is an insulator and does not allow electricity to pass through it.Circuits need conductors like metal wires to function.

116. Why is it important to check the terminal markings on cells?

Ans. : It's crucial to check the terminal markings on cells because electrical devices need the current to flow in a specific direction to function properly. Cells have a positive (+) and a negative (-) terminal, and if you connect them backward, the device might not work or could even be damaged.Therefore, ensuring correct connections with proper terminal markings is essential for the device to operate as intended and to prevent any potential damage.

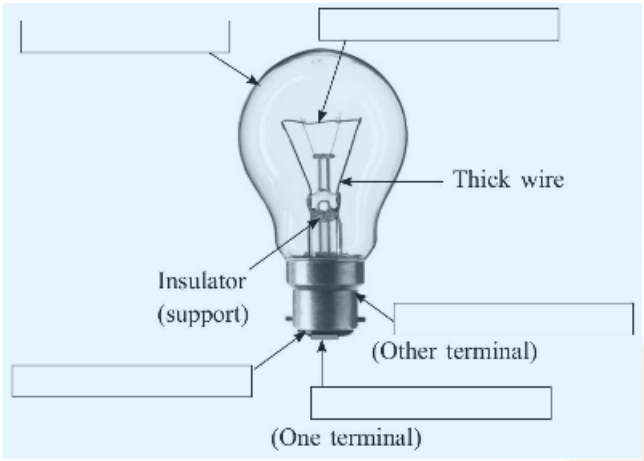
117. Look at the given images.



(i) Identify an open and closed circuit.
(ii) Which one allows flow of current?

Ans. : self

118. (i) Complete the labelling of the parts of an incandescent lamp used in a torch.



(ii) Why does not a lamp glow when rubber is used to connect wires?

Ans. : self

119. Why does the torch lamp glow in one position of its switch?

Ans. : The torch lamp glows when the switch is in the 'ON' position because it completes the electrical circuit, allowing current to flow through the lamp. When the switch is in the 'OFF'position, the circuit is open, and current cannot flow, so the lamp does not glow

120. How does a switch turn 'ON' or 'OFF' the torchlight?

Ans. : The switch controls the flow of electricity in the circuit. When the switch is 'ON', it closes the circuit, allowing electricity to flow through the lamp and make it glow. When the switch is 'OFF', it opens the circuit, stopping the flow of electricity, and the lamp goes off.

121. Can we represent the circuit in a simpler manner?

Ans. : Yes, the circuit (often representing components like cells, bulbs, or switches in a circuit diagram) can be represented by symbols. For example, a battery is represented by a pair of short and long parallel lines, and a lamp is represented by a circuit with an 'X' inside it.

122. Why did we use metal wire for making the electric circuit? Can we not use some other material for the wires?

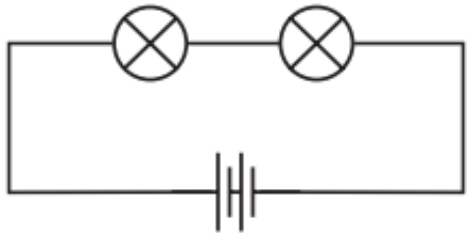
Ans. : Metal wires (usually copper) are used because metals are good conductors of electricity. They allow electric current to flow easily. While other materials could be used but they would not conduct electricity as efficiently. For example, rubber and plastic are insulators, so they can't carry current.

123. Why are electric wires covered with plastic or rubber?

Ans. : Electric wires are covered with plastic or rubber because these materials are insulators. They prevent electric current from escaping the wires and also protect

people from electric shocks. Additionally, the insulation keeps the wires from touching each other and causing short circuits.

124. In Fig., if the filament of one of the lamps is broken, will the other glow? Justify your answer.



Ans. : In Fig., the lamps are connected end to end (as indicated by the circuit diagram). If the filament of one of the lamps is broken, the other lamp will not glow. This is because in a line circuit, the current flows through all components one after another. If one component (like a lamp) is broken, the entire circuit is interrupted, and the current cannot flow through the rest of the circuit.

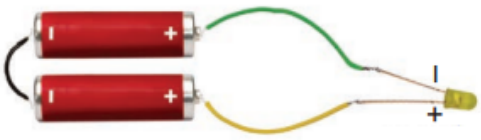
125. A student forgot to remove the insulator covering from the connecting wires while making a circuit. If the lamp and the cell are working properly, will the lamp glow?

Ans. : No, the lamp will not glow in this case. The insulator covering on the connecting wires prevents the flow of electric current. Since the current cannot pass through the insulated parts of the wires, the circuit remains incomplete, and the lamp will not light up.

126. Suppose the '+' and symbols cannot be read on a battery. Suggest a method to identify the two terminals of this battery.

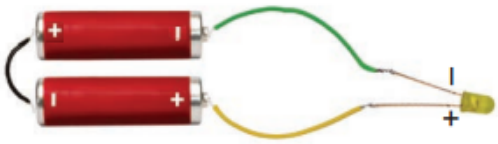
Ans. : Use a Circuit: Connect the battery to a light bulb. The correct connection will make the bulb glow brightly.
Check the Shape: The flat side is usually the negative (-) terminal, and the smaller protruding side is positive (+) terminal.

127. An LED requires two cells in series to glow. Tanya made the circuit as shown in Fig. Will the lamp glow? If not, draw the wires for correct connections.

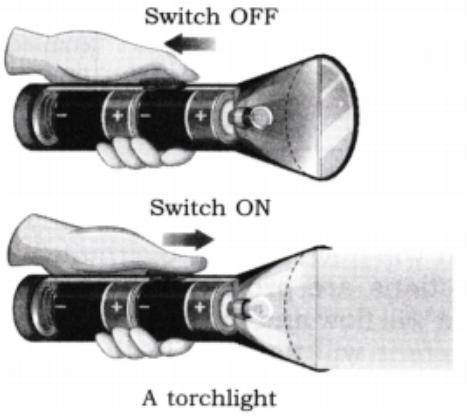


Ans. : The LED bulb will glow when the longer wire i.e., the positive terminal of LED is connected with positive terminal of battery and shorter wire i.e., the negative terminal of LED is connected with negative terminal of battery.
According to the given connection the LED will not glow, as negative terminal of LED

is connected with positive terminal of battery. The correct connection will be :



128. Observe the fig.



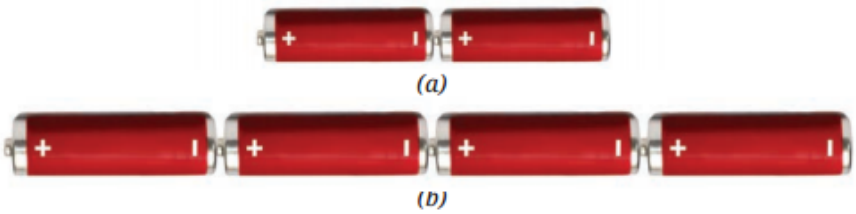
A torchlight

Ans. : Observation and conclusion: The torchlight glows when the switch is turned on because the electric cells inside provide energy to the lamp. When the switch is off, the circuit breaks and the lamp does not glow. This shows that a complete circuit is needed for electricity to flow.

129. Observe the fig.

Ans. : Conclusion: An electric cell has two terminals a positive terminal (metal cap) and a negative terminal (metal disc). These terminals help in the flow of electric current. The electric cell acts as a portable source of electrical energy.

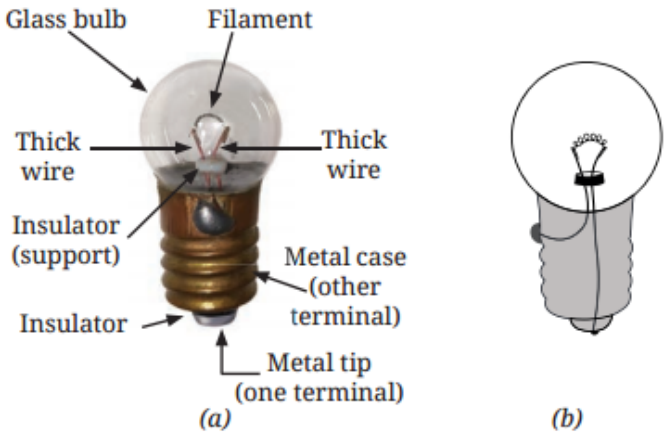
130. Observe the fig.



Ans. : Observation and conclusion: The torchlight glows only when the cells are placed in the correct order, with the positive terminal of one cell connected to the

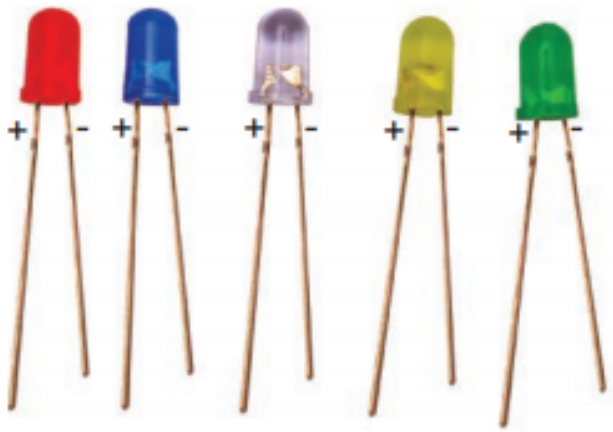
negative terminal of the next. This correct arrangement forms a battery, which allows electricity to flow and light the lamp.

131. Observe the fig.



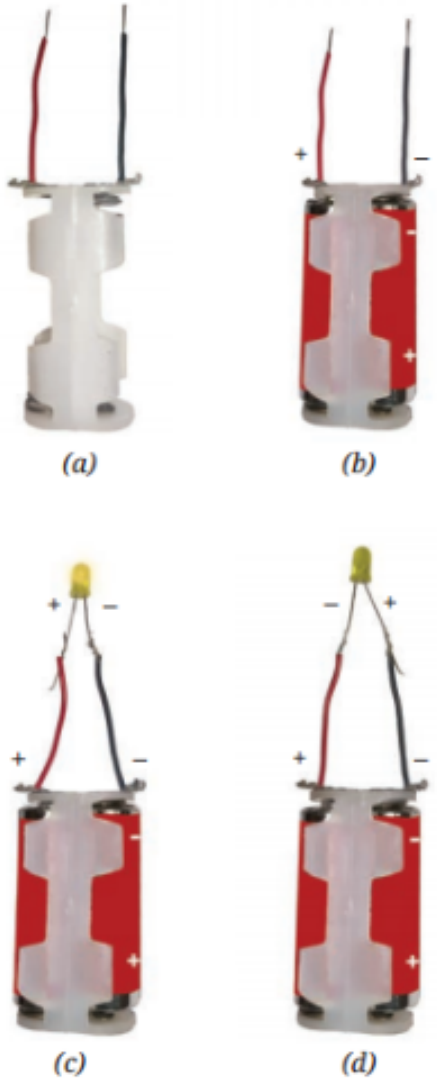
Ans. : Observation and conclusion: The glowing part of an incandescent lamp is a thin wire called the filament. The filament gets hot and glows when electricity passes through it, producing light. It is connected to two thicker wires that act as terminals. These wires are fixed in a way that they do not touch each other inside the lamp.

132. Observe the fig.



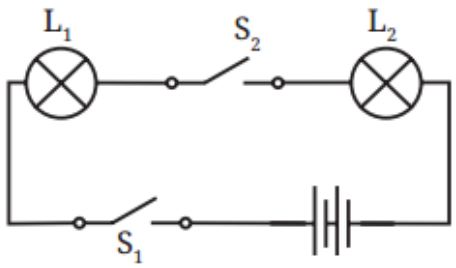
Ans. : Observation and conclusion: LEDs do not have filaments like incandescent lamps. They have two terminals one positive (longer wire) and one negative (shorter wire). The LED lights up when connected correctly to a battery. Some torch lamps may use LEDs of different shapes and colours.

133. Observe the fig.



Ans. : Observation and conclusion: The LED glows only when it is connected correctly the longer wire to the positive terminal and the shorter wire to the negative terminal of the battery as shown in fig.(a). This shows that electric current flows in only one direction through an LED. If the connections are reversed, the LED does not glow. This helps us learn how to properly connect components in a circuit.

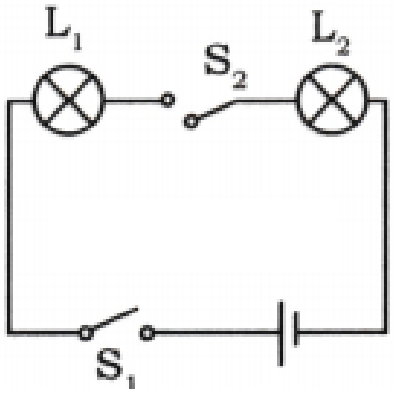
134.



(i) If S_2 is in 'ON' position, S_1 is in 'OFF' position, which lamp(s) will glow?
(ii) If S_2, is in 'OFF' position, S_1, is in 'ON' position, which lamp(s) will glow?

(iii) If S_1, and S_2, both are in 'ON' position, which lamp(s) will glow?
(iv) If both S_1, and S_2, are in 'OFF' position, which lamp(s) will glow?

Ans. :



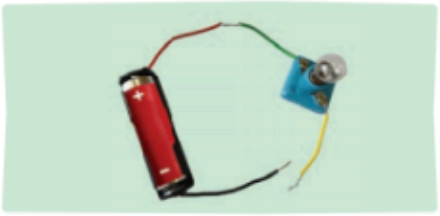
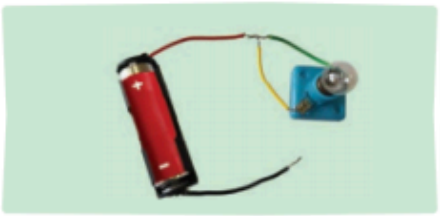
(i) S_2 'ON', St 'OFF': Lamp L_2 will glow.
(ii) S_2 'OFF', St 'ON': Lamp L_1 will glow.
(iii) S_1 'ON', S_2 'ON': Both lamps (L_1 and L_2) will glow.
(iv) S_1 'OFF', S_2 'OFF': Neither lamp will glow.

135. Vidyut has made the circuit as shown in Fig. Even after closing the circuit, the lamp does not glow. What can be the possible reasons? List as many possible reasons as you can for this faulty operation. What will you do to find out why the lamp did not glow?

Fig. 3.19

Ans. : Reasons :
(a) Loose Connections: Ensure sill wires are securely connected to the batteiy, lamp, and switch.
(b) Burnt-out Bulb: Tiy replacing the bulb with a new one to see if it works.
(c) Dead Battery: Check if the battery is providing power by testing with a multimeter.
(d) Faulty Switch: Test the switch by bypassing it (connect the wires directly) to see if the lamp glows.

136. Table : Trying to Make the Lamp Glow

S.No.	Arrangement of Cell and Lamp	Prediction	Observation
1.		The lamp will glow.	The current will flow as all connections are properly connected and the circuit is complete.
2.		The lamp will not glow.	The circuit is incomplete, so the current will not flow.
3.		The lamp will not glow.	The circuit is incomplete due to the disconnected wire.
4.		The lamp will not glow.	Two wires of the bulb are connected to the positive terminal of the cell.
5.		The lamp will not glow.	Two wires of the bulb are connected to the negative terminal of the cell.
6.		The lamp will glow.	The current will flow as all connections are properly connected and the circuit is complete.

Ans. : Observation and conclusion: The electric lamp will glow only when the current will flow inside the circuit. When all the connections are properly connected then only current will flow and the lamp will glow otherwise the current will not flow in the circuit and the lamp will not glow.

137. Explain the construction of a battery.

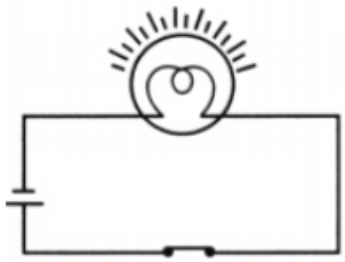
Ans. : A battery is a combination of two or more cells. It is constructed by placing the cells properly in a cell holder so that the positive terminal of one cell is connected to the negative terminal of the next cell. A metal wire is then connected to each of the two metal

138. What do you mean by a closed circuit with respect to the on-off switch?

Ans. : When the switch is in the 'ON' position, the circuit from the positive terminal of the battery to the negative terminal is complete. The circuit is then said to be closed and current flows through the circuit, causing the bulb to glow.

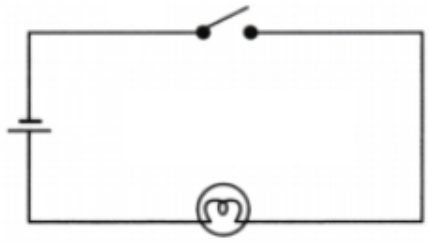
139. Why should we not touch the lighted bulb?

Ans. : We should never touch a lighted electric bulb connected to the mains because it may be very hot, and touching it could result in serious burns. Similarly, we should avoid experimenting with electrical supplies from the mains, a generator, or an inverter, as they may cause an electric shock.



140. What do you mean by an open circuit?

Ans. : When the switch is in the 'OFF' position, the circuit from the positive terminal of the battery to the negative terminal is incomplete. The circuit is then said to be open, and no current flows through the circuit, causing the



141. How is a battery formed?

Ans. : self

142. What are the two terminals of an electric cell?

Ans. : self

143. What is the function of a filament in an incandescent lamp?

Ans. : self

144. Which terminal of the electric cell is the positive terminal?

Ans. : self

145. What is the difference between an incandescent lamp and an LED lamp?

Ans. : self

146. Explain the construction of an electric cell.

Ans. : self

147. What is the purpose of a lamp holder?

Ans. : self

148. Why are metals like copper used for making electric wires?

Ans. : self

149. What is the role of an electric switch in a circuit?

Ans. : self

150. What is an electric circuit? Define the terms closed and open circuits

Ans. : self

151. Explain how an electric lamp can be made to glow using a cell or battery.

Ans. : self

152. What are the components of an electric circuit?

Ans. : self

153. What is the difference between a conductor and an insulator? Provide examples of each.

Ans. : self

154. Explain the working of an electric switch in a circuit.

Ans. : self

155. Explain the construction and working of an incandescent lamp.

Ans. : self

156. Describe the procedure to connect an electric lamp and an electric cell in a simple circuit.

Ans. : self

157. What is the function of a cell holder and lamp holder in an electric circuit?

Ans. : self

*** consists of questions of 3 marks each.** **[24]**

158. Read the passage and answer the questions :

Tanya connects an LED across a battery but it does not glow. She changes the direction and it works.

Q.1. Why did not the LED glow the first time?

(a) Broken battery (b) Reverse connection

(c) High voltage (d) Weak wire

Q.2. What nature does this show about LED?

(a) Can glow either way (b) Needs heat

(c) Works only in one direction

(d) Emits heat

Q.3. Which wire is the positive terminal of the LED?
(a) Longer wire (b) Shorter wire
(c) Any wire (d) None of these

Ans. : (b) Reverse connection
(c) Works only in one direction
(a) Longer wire

159. Make your own circuit of tester using battery, bulb, and wire and show it as a diagram.

Ans. : self

160. Conduct a test on classroom materials and sort them into conductors and insulators.

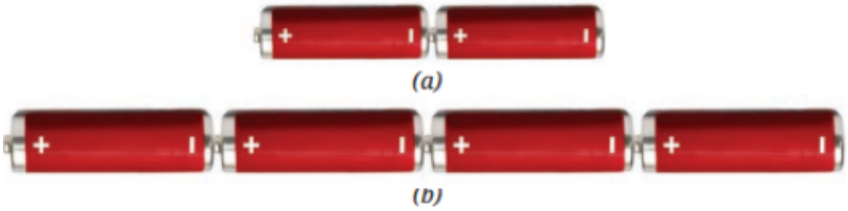
Ans. : → To begin, set up a simple circuit using a battery, a bulb with connecting wires, and alligator clips (if available). The circuit should have a gap where different materials can be tested.
→ Next, take each classroom material—such as a metal ruler, plastic pen, wooden pencil, paper clip, rubber eraser, and piece of paper—and place it in the circuit gap. Observe whether the bulb lights up or not.
→ If the bulb lights up, the material is a conductor, allowing electricity to flow through it easily; examples include metal rulers and paper clips. Conversely, if the bulb does not light up, the material is an insulator, hindering the flow of electricity; examples include plastic pens, wooden pencils, rubber erasers, and paper. By testing various materials, you can effectively categorize them based on their ability to conduct electricity.

161. You are given six cells marked A, B, C, D, E, and F. Some of these are working and some are not. Design an activity to identify which of them are working.
(i) List the items that you require.
(ii) Write the procedure that you will follow.
(iii) With the items, carry out the activity to identify the cells that are working.

Ans. : (i) Items Required:
1. Light bulb
2. Wires
3. Cells (A, B, C, D, E, F)
(ii) Procedure:
1. Connect the light bulb to one cell.
2. Check if the bulb glows. If it does, the cell is working.
3. Repeat the process for each cell (A, B, C, D, E, F).
(iii) Carrying Out the Activity:
1. Connect each cell one by one to the bulb.
2. The cells that make the bulb glow are working, and the ones that do not working.

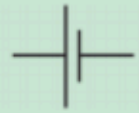
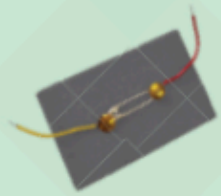
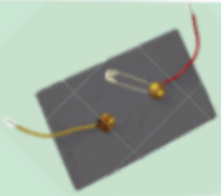
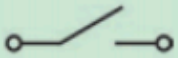
162. Define the term battery. How is it formed?

Ans. : A battery is a device formed by connecting two or more cells together. To form a battery, the cells are placed in a cell holder so that the positive terminal of one cell is connected to the negative terminal of the next cell, and so on. A metal wire is connected to each of the two metal clips on the cell holder.



163. Draw symbols for various electric circuit components.
    1. Electric cell
    2. Electric lamp
    3. Switch in 'ON' position
    4. Switch in 'OFF' position
    5. Battery
    6. Wire

Ans. :

S.No.	Electrical component	Symbol
1.	Electric cell 	
2.	Electric lamp 	
3.	Switch in 'ON' position 	
4.	Switch in 'OFF' position 	
5.	Battery 	
6.	Wire 	

164. A torchlight is a portable light source that runs on batteries. It uses electricity from the batteries to power an LED or an incandescent lamp, providing light in places without electrical outlets.

Q.1. What type of electricity powers a torchlight?

Q.2. What is the function of a torchlight's LED or incandescent lamp?

Q.3. What is the main component in a torchlight that stores energy?

Ans. : 1. Current electricity

2. To produce light

3. Battery

165. An electric cell is a portable source of electrical energy. The positive terminal of the electric cell is marked with a + sign, and the negative terminal is marked with a – sign.

Q.1. What is the terminal marked with a "+" sign called?

Q.2. What happens when an electric cell is connected to a circuit?

Q.3. Which terminal of the cell does the electric current flow from?

Ans. : 1. Positive terminal
2. It supplies electrical energy to the circuit.
3. Positive terminal

*** consists of questions of 5 marks each.** **[30]**

166. Describe the working of a torchlight.

Ans. : → A torchlight works by using a simple electrical circuit to produce light.
→ It starts with a battery (or multiple batteries) as its power source. When you turn the switch *on*, it closes the circuit, allowing electric current to flow from the battery.
→ This current travels through a thin wire called a filament (in older torchlights) or a Light Emitting Diode (LED) in newer ones. As the current passes through the filament, it heats up and glows brightly, producing light. In an LED, the current causes the diode to emit light directly.
→ The light is then focused by a reflector, which is a shiny, curved surface behind the bulb or LED, directing the light forward to illuminate the path in front of you.
→ When you switch the torch *off*, it breaks the circuit, stopping the flow of current and turning off the light.
→ So, in summary, a torchlight uses electrical energy from a battery to create light through a closed circuit involving a bulb or LED and a reflector to direct the light.

167. Draw a labelled diagram of a simple electric circuit.

Ans. : self

168. What are the safety precautions while working with electricity?

Ans. : → Electricity can be dangerous, and it's crucial to handle it with care to prevent injury or accidents.
→ Firstly, never touch electrical switches or plugs with wet hands, as water increases the risk of electric shock.
→ Secondly, avoid using electrical devices in wet areas or near water sources.
→ Thirdly, always ensure that electrical equipment is properly insulated, and never handle equipment with damaged insulation or broken plugs.
→ Remember, our body is a conductor of electricity, so it's essential to take precautions to prevent electric current from passing through it.

169. Describe how to make a simple switch.

Ans. : Materials Needed:
Two drawing pins,A safety pin (or paper clip),Two pieces of insulated wire},A small piece of cardboard
→ Take the small piece of cardboard. This will serve as the base for your switch.
→ Make sure the cardboard is dry and clean.
→ Push one of the drawing pins through the loop or head of the safety pin.
→ Insert this drawing pin into the cardboard.

→ Ensure the safety pin can rotate freely around the drawing pin. This will be the movable part of your switch.
→ Place the second drawing pin a short distance away from the first one on the cardboard.
→ Position it so that the free end of the safety pin can touch this drawing pin when rotated.
→ Push the second drawing pin firmly into the cardboard.
→ Take the two pieces of insulated wire.Wrap one end of the first wire around the first drawing pin (the one with the safety pin).
→ Wrap one end of the second wire around the second drawing pin.
→ Make sure the wire makes good contact with the metal of the drawing pins.
→ Now, switch is ready to be tested.
→ Connect the free ends of the wires into a circuit with a battery and a light bulb.
→ When the safety pin is touching the second drawing pin, the circuit is complete, and the bulb should light up.
→ When the safety pin is not touching the second drawing pin, the circuit is open, and the bulb should not light up.

170. Explain the difference between an LED and an incandescent lamp.

Ans. :

Feature	LED(Light Emitting Diode)	Incandescent Lamp
How it Works	Emits light when current passes through it	Heats a filament until it glows
Efficiency	Very energy-efficient	Inefficient
Lifespan	Long (thousands of hours)	Short
Heat	Produces very little heat	Produces a lot of heat
Polarity	Requires correct polarity	No polarity requirements
Filament	Do not have filaments	Have filaments

171. Identify Conductors and Insulators

(a)

(b)

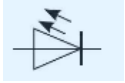
Ans. : Table : Identifying Conductors and Insulators

Object	Material: It is made up of	Lamp glows (Yes/No)	Conclusion (Conductor/ Insulator)
Stick	Wood	No	Insulator
Scale	Plastic	No	Insulator
Bangle	Glass	No	Insulator
Paper strip	Paper	No	Insulator
Candle	Wax	No	Insulator
Key	Metal	Yes	Conductor
Eraser	Rubber	No	Insulator
Paperclip	Metal	Yes	Conductor
Copper wire	Copper	Yes	Conductor
Aluminum foil	Aluminum	Yes	Conductor
Rubber band	Rubber	No	Insulator
Glass jar	Glass	No	Insulator

Observation and conclusion: This activity shows the difference between conductors and insulators. Conductors allow electricity to flow through them, making the lamp glow. Insulators, on the other hand, do not allow the current to pass through them, so the lamp stays off.

*** Match the Following.** **[8]**

Column A	Column B
172. Electric cell	(a) Closes or opeus circuit
173. L.E.D	(b) Portable energy source

174. Swith	(c) 
175. Filament	(d) Insulator
	(c) Glows when heated

Ans. : (1-b,2-c,3-a,4-e)

Component	Function
176. Battery	(a) Conducts electricity between components
177. Switch	(b) Lights up when current flows through it
178. Bulb	(c) Controls the flow of current in the circuit
179. Wire	(d) Provides electrical energy to the circuit

Ans. :

Component	Function
1. Battery	(d) Provides electrical energy to the circuit
2. Switch	(c) Controls the flow of current in the circuit
3. Bulb	(b) Lights up when current flows through it
4. Wire	(a) Conducts electricity between components

----- -----