



PHYSICS

BOOKS - SELINA PHYSICS (ENGLISH)

HOUSEHOLD CIRCUITS

Examples

1. How will you connect a bulb and a socket in a room to the mains ? Draw a labelled diagram

in support of your answer. Use switch and fuse wherever necessary.

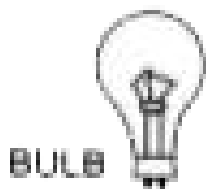
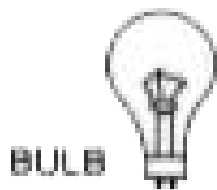


Watch Video Solution

2. The diagram in Fig. shows a battery, a switch and two bulbs.

Complete the diagram to show the electric

connections of the bulbs to the battery.



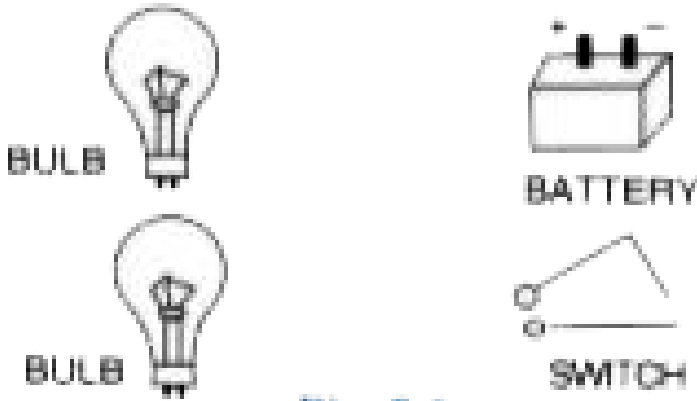
 [Watch Video Solution](#)

3. The diagram in Fig. shows a battery, a switch and two bulbs.

(a) Complete the diagram to show the electric connections of the bulbs to the battery.

How have you joined the bulbs in part (a) ?

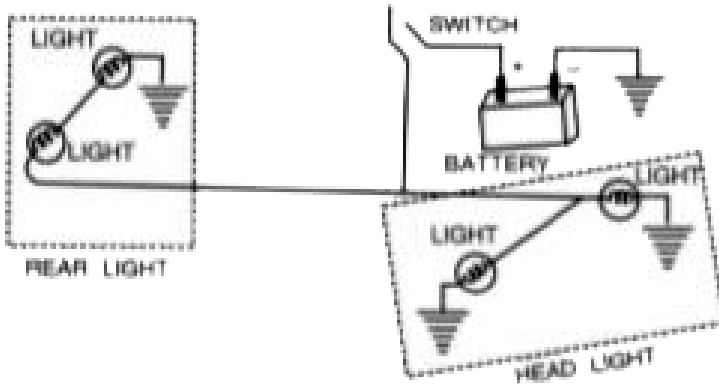
Give reason.



[Watch Video Solution](#)

4. The diagram in Fig. shows the electrical system of a car to operate the two head lights and two rear lights by a switch.

shows a connection to the body of the car.



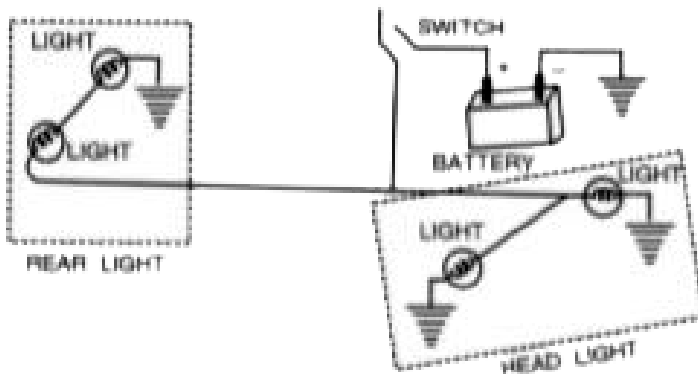
The diagram shows only one lead from the battery to each bulb, but a complete circuit must have two leads. How does the current get back to the battery?



Watch Video Solution

5. The diagram in Fig. shows the electrical system of a car to operate the two head lights and two rear lights by a switch.

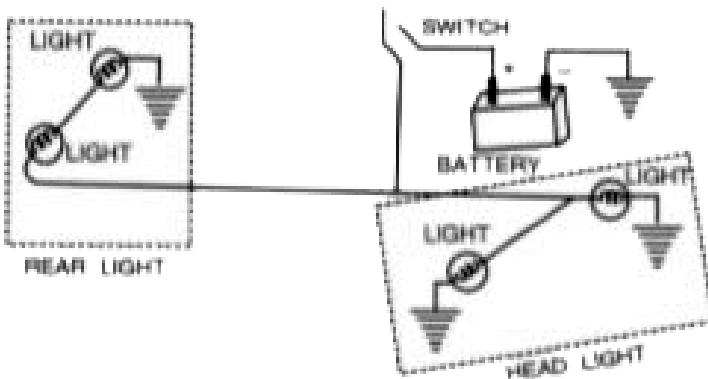
shows a connection to the body of the car.



The two rear lights as connected in diagram glow faintly. Why do they glow faintly? How should they be connected to glow brightly ? Show by a separate diagram.

6. The diagram in Fig. shows the electrical system of a car to operate the two head lights and two rear lights by a switch.

shows a connection to the body of the car.



If the lights are on, they become dim when the car is started. Give a reason.



[Watch Video Solution](#)

7. An electric bulb rated '220 V, 60 W' glows when connected with 220 V mains.

Find the resistance of the filament of the bulb.



[Watch Video Solution](#)

8. An electric bulb rated '220 V, 60 W' glows when connected with 220 V mains.

Another identical bulb is connected in series with the first one and the system is connected

across the 220 V mains. Draw a diagram to show the arrangement and find : (a) the rate of consumption of energy in each bulb, and (ii) total power consumed.



[Watch Video Solution](#)

9. An electric bulb rated '220 V, 60 W' glows when connected with 220 V mains.

If two bulbs are connected in parallel, draw a diagram of this arrangement. What will then be the total power consumed ?



[Watch Video Solution](#)

10. An electric motor of power 3 kW is to be operated at mains of 220 V. Find the current rating of the fuse to be connected with the motor.



[Watch Video Solution](#)

11. A house has main fuse of 5 A rating. 5 bulbs each of 60 W and 2 tube lights each of 40 W

are used simultaneously. Find :

the current drawn from the mains of 220 V,



[Watch Video Solution](#)

12. A house has main fuse of 5 A rating. 5 bulbs each of 60 W and 2 tube lights each of 40 W are used simultaneously. Find :

the number of additional bulbs each of 100 W which can also be lighted on a festival day?



[Watch Video Solution](#)

Exercise 9 A

1. At what voltage and frequency is the electric power generated at the power generating station ?



[Watch Video Solution](#)

2. At what voltage and frequency is the electric power generated at the power generating station ?



[Watch Video Solution](#)

3. What is the nature of current transmitted from the power station ?



[Watch Video Solution](#)

4. In the transmission of power the voltage of power generated at the generating station is stepped up from 11 kV to 132 kV before it is transmitted. Why?



[Watch Video Solution](#)

5. Explain with the aid of a simple diagram, the transmission of electric power from the generating station to your house.



[Watch Video Solution](#)

6. At what voltage is the alternating current supplied to our houses ?



[Watch Video Solution](#)

7. At what frequency is A.C. supplied to residential houses ?



[Watch Video Solution](#)

8. Name the device used to increase the voltage at a generating station.



[Watch Video Solution](#)

9. Name the device used to decrease the voltage at the sub station for its

supply.



Watch Video Solution

10. Name the three connecting wires used in a household circuit.



Watch Video Solution

11. Which of the two wires mentioned in part (a) are at the same potential ?



Watch Video Solution

12. Name the wire in a household electrical circuit to which the switch is connected.



Watch Video Solution

13. What is the pole fuse ? Write down its current rating.



Watch Video Solution

14. State the function of each of the following
in a house circuiting:

kWh meter



Watch Video Solution

15. What is the function of a fuse?



Watch Video Solution

16. State the function of each of the following in a house circuiting:
main switch.



[Watch Video Solution](#)

17. In what unit does the domestic electric meter measure the electrical energy consumed? State the value of unit in SI unit of energy.



[Watch Video Solution](#)

18. The main fuse is connected to the



Watch Video Solution

19. State one advantage of using the main switch in house wiring.



Watch Video Solution

20. Draw a circuit diagram to explain the ring system of house wiring. State two advantages of it.



Watch Video Solution

21. Draw a labelled diagram with the necessary switch, regulator, etc. to connect a bulb and a fan with the mains. In what arrangement are they connected to the mains : series or parallel ?





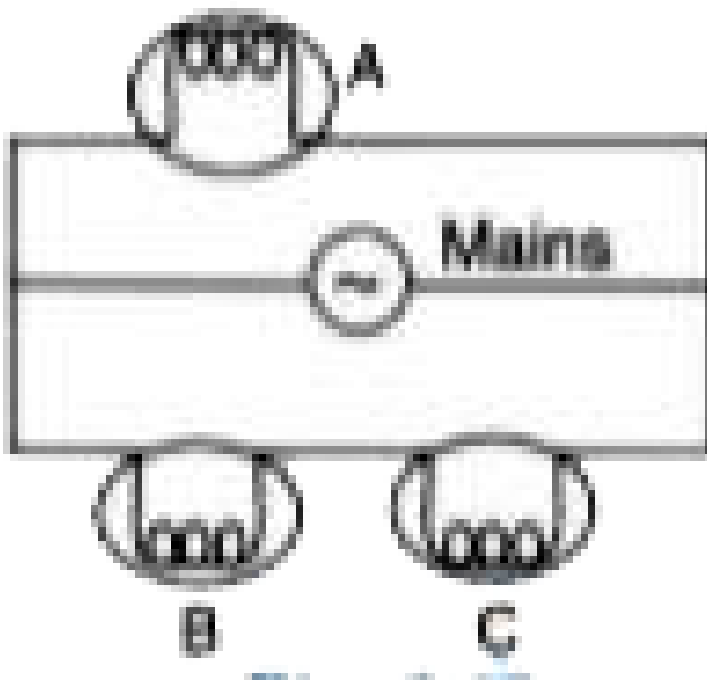
[Watch Video Solution](#)

22. How should the several electric lamps be connected with the mains so that the switching on or off a lamp has no effect on the operation of other lamps ?



[Watch Video Solution](#)

23. Fig. shows three bulbs A, B and C each of rating 100 W, 220 V connected to the mains of 220 V. Answer the following: (



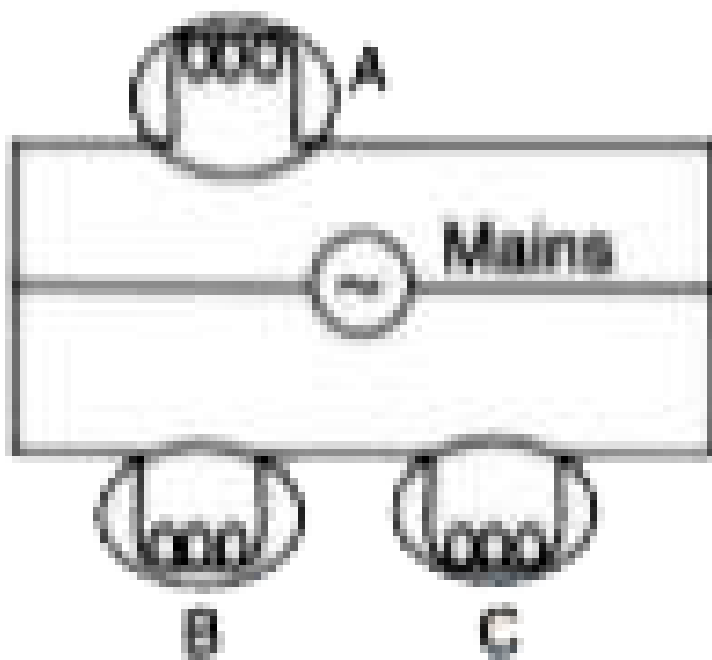
How is the bulb A connected with the mains?

At what voltage does it glow ?



[Watch Video Solution](#)

24. Fig. shows three bulbs A, B and C each of rating 100 W, 220 V connected to the mains of 220 V. Answer the following: (

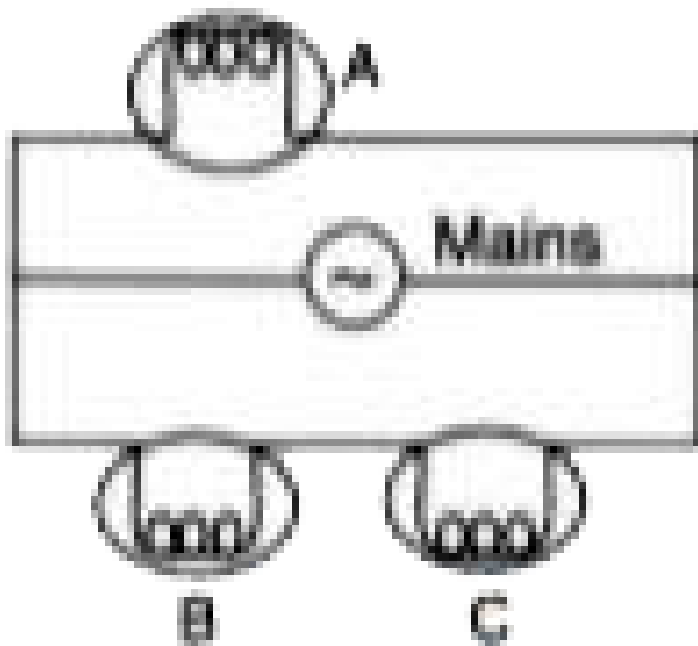


How are the bulbs B and C connected with the mains ? At what voltage does the bulb B glow?



Watch Video Solution

25. Fig. shows three bulbs A, B and C each of rating 100 W, 220 V connected to the mains of 220 V. Answer the following: (

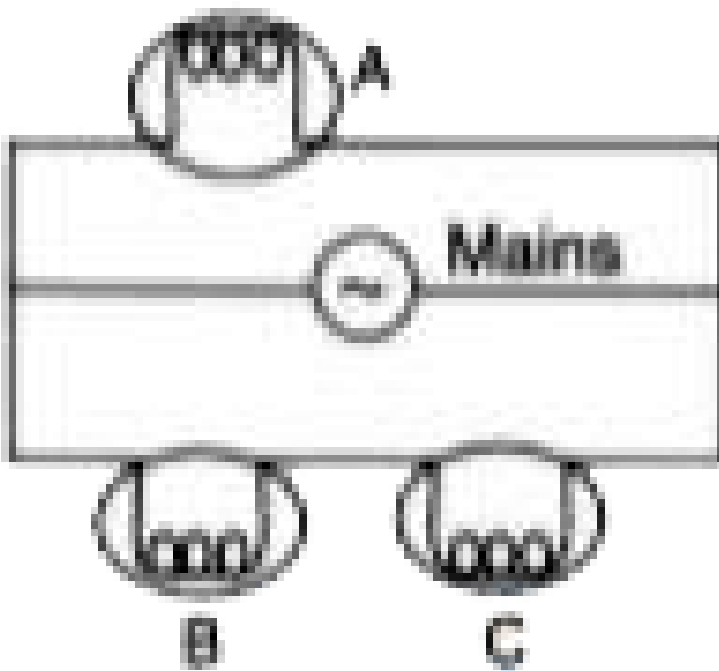


How is the glow of bulbs A and C affected if bulb B gets fused ?



[Watch Video Solution](#)

26. Fig. shows three bulbs A, B and C each of rating 100 W, 220 V connected to the mains of 220 V. Answer the following: (



How is the glow of bulbs B and C affected if bulb A gets fused ?

 [Watch Video Solution](#)

27. Two sets A and B each of four bulbs are glowing in two separate rooms. When one of the bulbs in set A is fused, the other three bulbs also cease to glow. But in set B, when one bulb fuses, the other bulbs continue to glow. (i) Explain the difference in the two sets. (ii) Which set of arrangement is preferred in housing circuit and why ?



[Watch Video Solution](#)

1. The main fuse is connected to the

A. live wire

B. neutral wire

C. both the live and earth wires

D. both the earth and neutral wires.

Answer: A



Watch Video Solution

2. The electrical appliances in a house are connected in:

A. series

B. parallel

C. either in series or parallel

D. both in series and parallel.

Answer: B



Watch Video Solution

3. The electric meter in a house records the consumption of:

A. charge

B. current

C. energy

D. power

Answer: C



Watch Video Solution

Exercise 9 B

1. What is a fuse ? Name the material of fuse.
State one characteristic of the material used for fuse.



[Watch Video Solution](#)

2. Name the device used to protect the electric circuits from overloading and short circuits.



[Watch Video Solution](#)

3. Complete the following sentences :

A fuse is a short piece of wire of high..... and
of material of low.....



[Watch Video Solution](#)

4. Complete the following sentences :

A fuse wire is made of an alloy of If
the current in a circuit exceeds the current
rating of the fuse wire, it



[Watch Video Solution](#)

5. Complete the following sentences :

A fuse is connected in..... with the ... wire.



Watch Video Solution

6. Complete the following sentences :

Higher the current rating, ... is the fuse wire.



Watch Video Solution

7. Complete the following sentences :

Live wire is also called wire.



Watch Video Solution

8. Why is the fuse wire fitted in a porcelain casing?



Watch Video Solution

9. How is a fuse put in an electric circuit ?

State the purpose of using a fuse in a circuit.



Watch Video Solution

10. Describe with the aid of a diagram some form of a fuse which is used in the electric lighting circuit of a house. Give two reasons why a fuse must not be replaced by an ordinary copper wire.



Watch Video Solution

11. Why should switches always be connected to the live wire?



Watch Video Solution

12. How does the (i) thickness and (ii) length of a fuse wire depend on its current rating?



Watch Video Solution

13. Two fuse wires are rated 5 A and 20 A.

Which of the two is (i) thicker, (ii) longer ?



Watch Video Solution

14. Explain the meaning of the statement, 'The current rating of a fuse is 5 A'.



Watch Video Solution

15. 'A fuse is rated 8 A'. Can it be used with an electrical appliance of rating 5 kW, 200 V ?



Watch Video Solution

16. Name two safety devices which are connected to the live wire of a household electric circuit.



Watch Video Solution

17. An electric kettle is rated 3 kW, 250 V. Give reason whether this kettle can be used in a circuit which contains a fuse of current rating 13 A.



Watch Video Solution

18. What is the purpose of a switch in a circuit ?



Watch Video Solution

19. Why should switches always be connected to the live wire?



Watch Video Solution

20. Give one precaution that should be taken while handling switches.



Watch Video Solution

21. The switch should not be touched with wet hands.



Watch Video Solution

22. Name the wire in a household electrical circuit to which the switch is connected.



Watch Video Solution

23. It is dangerous to connect the switch in the neutral wire. Explain your answer.



Watch Video Solution

24. Draw the diagram of a dual control switch when the appliance is switched 'ON'.



Watch Video Solution

25. Draw a circuit diagram using the dual control switches to light a staircase electric light and explain its working



Watch Video Solution

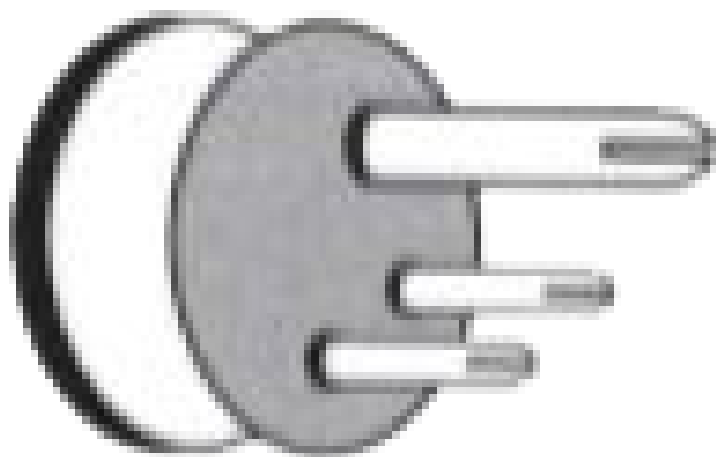
26. What purpose is served by the terminals of a three way pin plug ? Draw a diagram and name the pins.



Watch Video Solution

27. The diagram in Fig. shows a three pin plug.

Label the three pins.



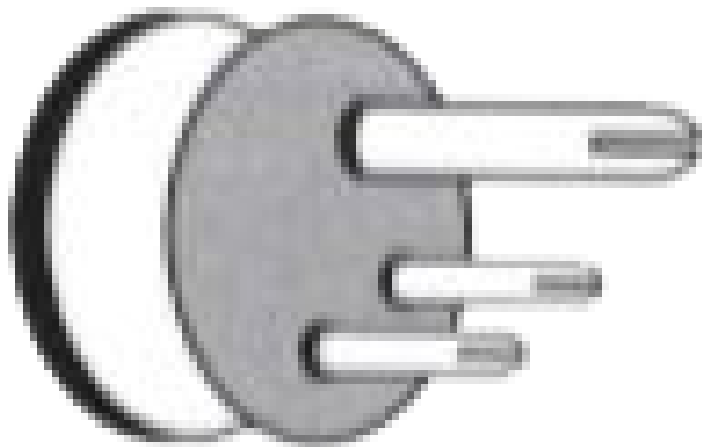
Why is the top pin thicker and longer than the other two ?



[Watch Video Solution](#)

28. The diagram in Fig. shows a three pin plug.

Label the three pins.



Why are the pins splitted at the ends?



[Watch Video Solution](#)

29. Draw a labelled diagram of a three pin socket.



Watch Video Solution

30. The diagram in Fig. shows a three-pin socket marked as 1, 2 and 3.



Identify and write live (L), neutral (N) and earth (E) against the correct number.



Watch Video Solution

31. The diagram in Fig. shows a three-pin socket marked as 1, 2 and 3.



To which part of the appliance is the terminal 1 connected ?



[Watch Video Solution](#)

32. The diagram in Fig. shows a three-pin socket marked as 1, 2 and 3.



To which wire joined to 2 or 3, is the fuse connected ?

 [Watch Video Solution](#)

33. What do you mean by the term local earthing ? Explain how it is done.



Watch Video Solution

34. To which wire is the metallic case of an electric appliance connected ? Give the reason.



Watch Video Solution

35. The earthing of an electric appliance is useful only if the fuse is in the live wire. Give the reason.



Watch Video Solution

36. Name the part of the appliance which is earthed.



Watch Video Solution

37. For earthing an electric appliance, one has to remove the paint from the metallic body of the appliance where the electric contact is made. Explain the reason.



Watch Video Solution

38. according to the new international convention ,the colour of insulation for live wire is



Watch Video Solution

39. What is the colour code for the insulation on the neutral



Watch Video Solution

40. What is the colour code for the insulation on the earth wire



Watch Video Solution

41. Which wire in a power circuit is connected to the metallic body of the appliance ?



Watch Video Solution

42. Name the colour code of the wire which is r connected to switch for the appliance



Watch Video Solution

43. How does the colour code of wires in a cable help in house wiring ?



Watch Video Solution

44. A power circuit uses a cable having three different wires.

Name the three wires of the cable.



Watch Video Solution

45. A power circuit uses a cable having three different wires.

Between which of the two wires should the heating element of an electric geyser be connected ?



Watch Video Solution

46. A power circuit uses a cable having three different wires.

To which wire should the metallic case of the geyser be connected ?



[Watch Video Solution](#)

47. A power circuit uses a cable having three different wires.

To which wire should the switch and fuse be connected ?



[Watch Video Solution](#)

48. State two circumstances when one may get an electric shock from an electric gadget.

What preventive measure must be provided with the gadget to avoid it ?



Watch Video Solution

49. Why is it necessary to have an earth wire installed in a power circuit, but not in a lighting circuit ?



Watch Video Solution

50. Give two characteristics of a high tension wire.



Watch Video Solution

51. Which of the cables, one rated 5 A and the other 15 A will be of thicker wire ? Give a reason for your answer.



Watch Video Solution

52. The diagram in Fig. shows three lamps and three switches 1, 2 and 3 connected with two cells.

Name the switch/switches to be closed so as to light all the three lamps.

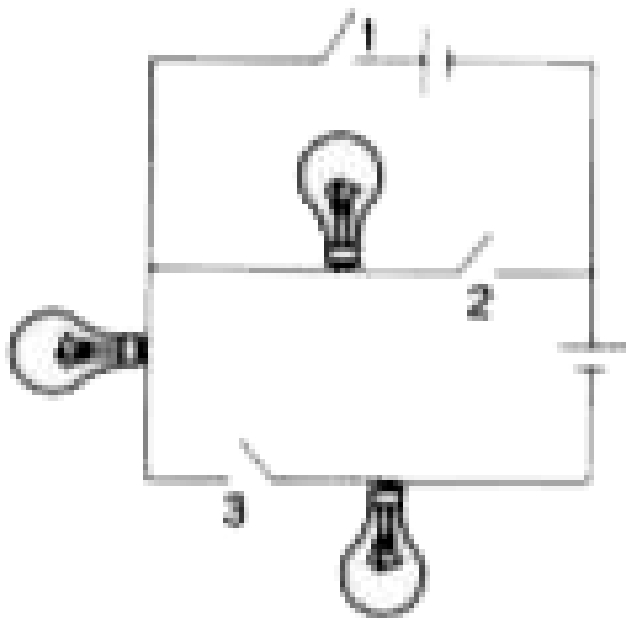


Watch Video Solution

53. The diagram in Fig. shows three lamps and three switches 1, 2 and 3 connected with two cells.

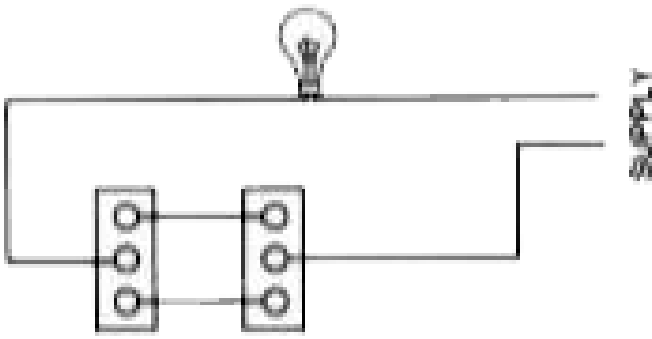
How are then the lamps connected : in series

or in parallel ?



[Watch Video Solution](#)

54. The Fig. below shows a dual control switch circuit use to light a bulb.

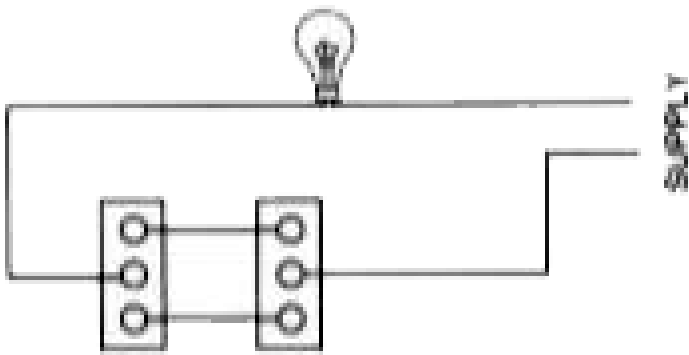


Complete the circuit so that bulb is switched on.



[Watch Video Solution](#)

55. The Fig. below shows a dual control switch circuit use to light a bulb.



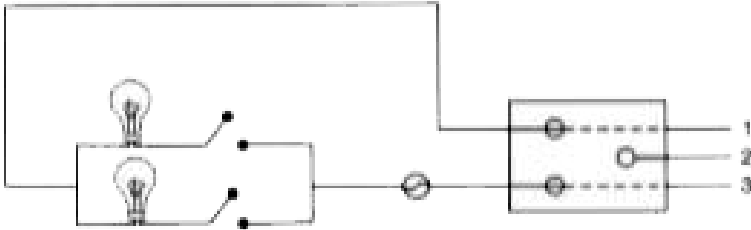
Mark the supply terminals with L and N to indicate live and neutral wires.



[Watch Video Solution](#)

56. Fig. below shows two bulbs with switches and fuse connected to the mains through a three pin socket by means of a three wires

cable.

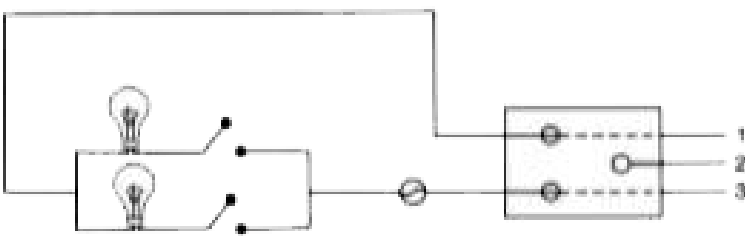


Label each component - bulb, switch, fuse and socket.



Watch Video Solution

57. Fig. below shows two bulbs with switches and fuse connected to the mains through a three pin socket by means of a three wires cable.

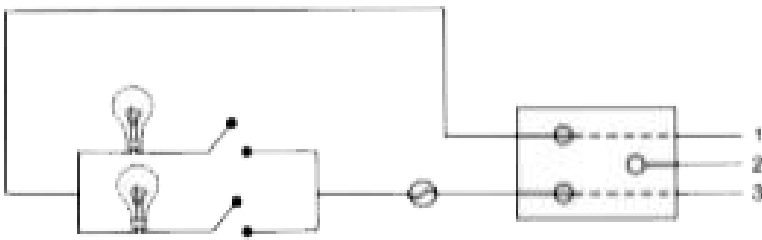


Name and state the colour of insulation of each wire 1, 2 and 3.



Watch Video Solution

58. Fig. below shows two bulbs with switches and fuse connected to the mains through a three pin socket by means of a three wires cable.



How are the two bulbs joined : in series or in parallel ?



[Watch Video Solution](#)

Exercise 9 B Multiple Choice Type

1. The rating of a fuse connected in the lighting circuit is :

A. 15 A

B. 5 A

C. 10A

D. zero

Answer: B



Watch Video Solution

2. A switch must be connected in the :

A. live wire

B. neutral wire

C. earth wire

D. either earth or neutral wire.

Answer: A



Watch Video Solution