PHYSICS

BOOKS - CHETANA PUBLICATION

Current Electricity

Example

1. What do you mean by current electricity?

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2. Name the three types of electrical conductors?

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3. Does a semiconductor diode and resistor have similar electrical properties?

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4. What is the effective resistance when two or more resistors are connected in series?

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5. What is the effective resistance when two or more resistors are connected in parallel?

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6. Name the laws used for analyzing complicated circuits?

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7. Give the basic difference between the electrical properties of a semiconductor diode and resistor?

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8. Define junction.

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9. Define loop or mesh.

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10. Define branch.

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11. State the uses of Kirchhoff's Laws.

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12. Are Kirchhoff's Laws applicable for both AC and DC currents.

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13. State Kirchhoff's Laws.

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14. Explain : Kirchhoff's first laws is in accordance with law of conservation of charge.

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15. Explain: Kirchhoff's second law is in accordance with law of conservation of energy.

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16. State and explain the sign conventions for Kirchhoff's first law.

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17. State and explain the sign conventions for Kirchhoff's first law.

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18. Write down Steps followed while solving a problem using Kirchhoff's laws:

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19. Figure shows currents in a part of electrical circuit. Find the current I?

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20. Two batteries of 7 volt and 13 volt and internal resistances 1 ohm and 2 ohm respectively are connected in parallel with a resistance of 12 ohm. Find the current through each branch of the circuit and the potential difference across 12-ohm resistance.

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21. A battery of emf 4 volt and internal resistance $1\Omega$is connected in parallel with

another battery of emf 1 V and internal resistance 1Ω (with their like poles connected together). The combination is used to send current through an external resistance of 2Ω. Calculate the current through the external resistance.

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22. Two cells of emf 1.5 Volt and 2 Volt having respective internal resistances of 1Ω and 2Ω are connected in parallel so asto send current

in same direction through an external resistance of 5Ω. Find the current through the external resistance.

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23. A voltmeter has a resistance 30Ω. What will be its reading, when it is connected across a cell of emf 2 V having internal resistance 10Ω?

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24. A set of three coils having resistances 10Ω, 12Ω and 15Ω are connected in parallel. This combination is connected in series with series combination of three coils of the same resistances. Calculate the total resistance and current through the circuit, if a battery of emf 4.1 Volt is used for drawing current.

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25. A voltmeter has a resistance of 100Ω. What will be its reading when it is connected across a cell of emf 2 V and internal resistance 20Ω?

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26. Name the factors affecting the resistance of a material.

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27. Which are conjugate arms in the Wheatstone's bridge? Why?

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28. State the applications of Wheatstone Bridge? Why?

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29. Obtain balancing condition in case of Wheatstone Network. (By using Kirchhoffs law Obtain balancing condition in case of Wheatstone Network)

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30. Obtain balancing condition in case of Wheatstone's network. (By using Ohm's law.)

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31. At what value should the variable resistor be set such that the bridge is balanced? If the source voltage is 30 V find the value of the output voltage across XY, when the bridge is balanced.

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32. Why meter bridge is also called Wheatstone's metre bridge.

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33. Does the value of resistance of a conductor depend upon the potential difference applied across it or current passed through it?

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34. Describe the construction of meter bridge to determine an unknown resistance.

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35. Explain with neat circuit diagram, how you wil determine the unknown resistance using a meter bridge.

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36. Four resistance 10Ω, 10Ω,10Ω and 20Ω are connected so as to form Wheatstone's bridge. The resistance connected across 20Ω resistance to balance the bridge is

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37. Describe the construction Kelvin's method to determine the resistance of Galvanometer by using meter bridge.

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38. Define potentiometer.

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39. What is a potentiometer?

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40. Do you know an instrument which can measure terminal P.D. as well as e.m.f.?

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41. Name the device used for the measurement of internal resistance of a cell.

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42. Why there is no way to separate the internal resistance from the e.m.f. of a cell?

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43. On what factors does the internal resistance of a cell depend?

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44. Is internal resistance a defect of a cell? Explain.

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45. State the advantages of potentiometer over voltmeter.

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46. State the disadvantages of potentiometer over voltmeter.

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47. Why is potentiometer preferred over a voltmeter for measuring emf? or explain. Potentiometer acts as an ideal voltmeter .

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48. State and explain principle of potentiometer.

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49. Describe the construction of potentiometer.

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50. Define potential gradient. State its unit and dimension.

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51. Obtain the dimension of potential gradient.

Watch Video Solution

52. On what factors does a potential gradient of a wire depend.

Watch Video Solution

53. What is potential gradient? How it is measured? Explain.

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54. Why jockey should not be slided along the potentiometer wire?

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55. State the uses of a potentiometer.

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56. State what precautions must be taken while performing experiment with potentiometer.

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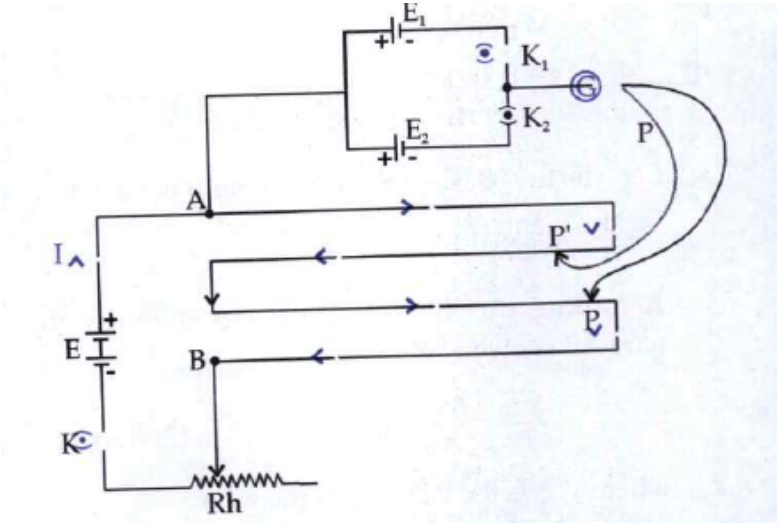
57. Describe the use of potentiometer to compare the e.m.f. of two cells by the direct method (individual method).



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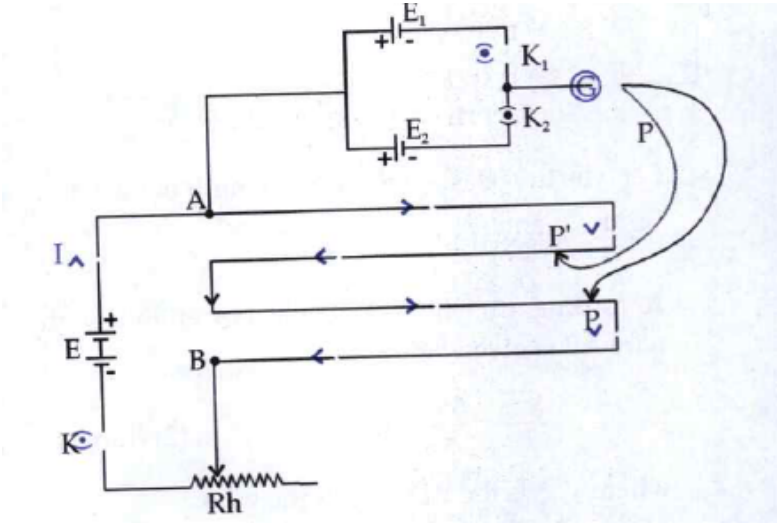
58. Describe how a potentiometer is used to compare the e.m.f.s of two cells by connecting them separately.



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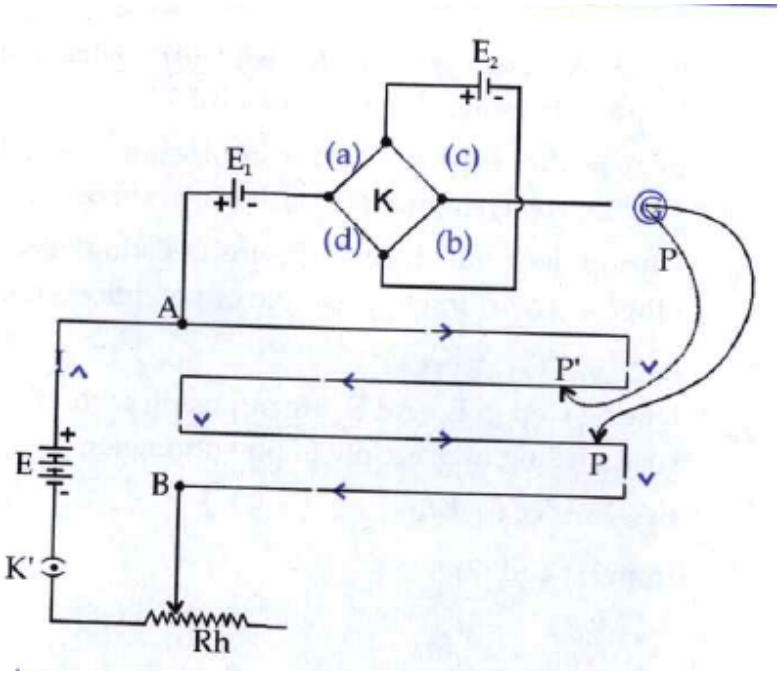
59. Describe how potentiometer is used to compare the e.m.f.s of two cells by combination method.



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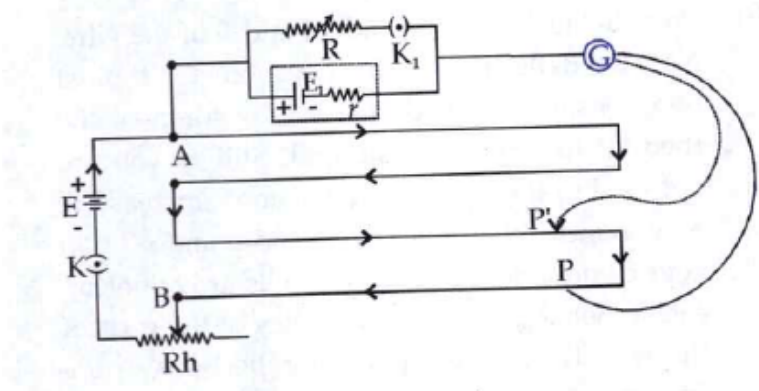
60. Describe with the help of neat diagram how will you determine the internal resistance of a cell by using potentiometer. Derive the necessary formula.



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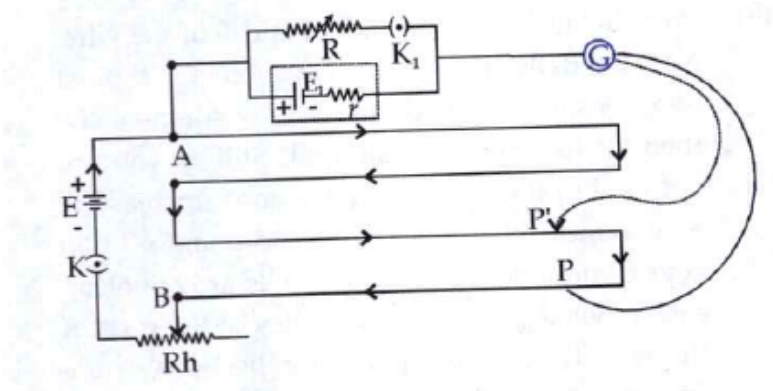
61. Explain the use of potentiometer for determining he internal resistance of cell.



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62. What will be the effect on the position of zero deflection if only the current flowing

through the potentiometer wire is Explain:- increased

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63. What will be the effect on the position of zero deflection if only the current flowing through the potentiometer wire is:- decreased.

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64. A potentiometer wire has a length of 1.5 m and resistance of 10Ω. It is connected in series with the cell of emf 4 Volt and internal resistance 5Ω. Calculate thepotential drop per centimeter of the wire.

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65. When two cells of emfs. E_1 and E_2 are connected in series so as to assist each other, their balancing length on a potentiometer is

found to be 2.7 m. When the cells are connected in series so as to oppose each other, the balancing length is found to be 0.3 m. Compare the emfs of the two cells.

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66. In an experiment to determine the internal resistance of a cell of emf 1.5 V, the balance point in the open cell condition is 76.3 cm. When a resistor of 9.5 ohm is used in the external circuit of the cell the balance point

shifts to 64.8 cm of the potentiometer wire. Determine the internal resistance of the cell.

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67. The emf of a cell is balanced by a length of 120 cm of potentiometer wire. When the cell is shunted by a resistance of 10Ω, the balancing length is reduced by 20 cm. Find the internal resistance of the cell.

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68. A potential drop per unit length along a wire is $5 \times 10^{-3} V/m$. If the emf of a cell balances against length 216 cm of this potentiometer wire, find the emf of the cell.

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69. The resistance of a potentiometer wire is $8\Omega$and its length is 8 m. A resistance box and a 2V battery are connected in series with it. What should be the resistance in the box, if it

is desired to have a potential drop of $1\mu V/mm$?.

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70. What is a Galvanometer?

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71. What are the types of moving coil Galvanometer?

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72. State the principle of moving coil Galvanometer?

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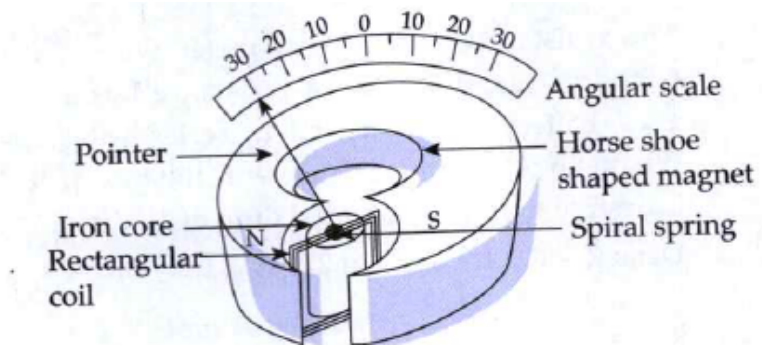
73. With the help of neat diagram, describe the theory of moving coil Galvanometer?



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74. State the modification necessary to convert a moving col Galvanometer into ammenter?

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75. State the uses of shunt connected across, Galvanometer.

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76. Explain how a moving coil Galvanometer is converted into an ammeter. Derive the necessary formula.

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77. If I = n Ig then in moving coil Galvanometer. Show that:- $S = \frac{G}{n-1}$

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78. If I = n Ig then in moving coil Galvanometer.

Show that:- $\frac{Is}{I} = \frac{G}{S+G}$

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79. A galvanometer has a resistance of 100Ω and its full scale deflection current is $100\mu A$. What shunt resistance should be added so that the ammeter can have a range of 0 to 10 mA ?.

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80. What is the value of the shunt resistance that allows 20% of the main current through a galvanometer of 99Ω?.

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81. State the modification necessary to convert a moving coil galvanometer into voltmeter.

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82. State the uses of resistance connected in series with the galvanometer.

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83. Explain how a moving coil galvanometer is converted into voltmeter. Derive the necessary formula.

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84. If V = $n_v V_g$ then show that X = G$(n_v - 1)$.

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85. A Galvanometer has a resistance of 25Ω and its full scale deflection current is $25\mu A$. What resistance should be added to it to have a range of 0 -10 V.

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86. A Galvanometer has a resistance of 40 D and a current of 4 mA is needed for a full scale deflection. What is the resistance and how is it to be connected to convert the galvanometer:- into an ammeter of 0.4 A range and

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87. A Galvanometer has a resistance of 40 D and a current of 5 mA is needed for a full scale deflection. What is the resistance and how is it

to be connected to convert the galvanometer:-

into a voltmeter of 0.5 V range?

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88. What is called thermoelectric effect?

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89. Who discovered thermoelectric effect?

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90. Explain thermoemf, seeback effect and thermocouple?

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91. Give two examples of thermocouple using diagram?

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92. Write the equation for thermo emf when cold junction is at $0^{\circ}C$ and the hot junction is at $T^{\circ}C$ what will be the shape of graph showing variation of thermo emf with a temperature?

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93. Distinguish between potentiometer and voltmeter..

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94. Distinguish between Meterbridge experiment and Kelvin's method.

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95. Distinguish between ammeter and voltmeter.

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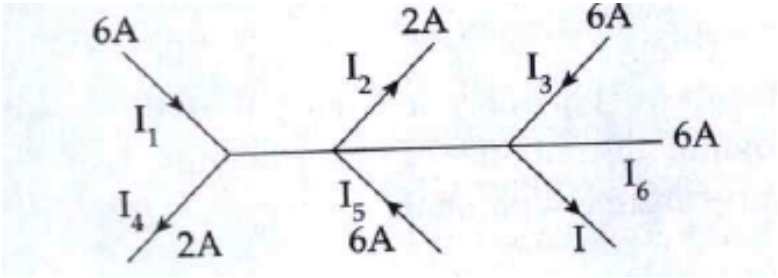
Exercise

1. (1)In the following circuit, calculate the value of the current (I).



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2. In an electric circuit, the currents 2A, 1.5A and 3A flow towards the junction. While a current of 2.5A and an unknown current leave

the junction. Find the magnitude of unknown current.

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3. A resistance of 2Ω is connected in parallel to a galvanometer of resistance 48Ω. Find the percentage of fraction of total current passing through the resistance of 2Ω.

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4. A galvanometer has a resistance of 16Ω. It shows full scale deflection when a current of 20mA is passed through it. The only shunt resistance available is 0.06W which is not appropriate to convert galvanometer into ammeters. How much resistance should be connected in series with the coil of galvanometer so that the range of ammeter is 8A?

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5. A moving coil galvanometer has a resistance of 25Ω and goes a full scale deflection for a current of 10mA. How will you convert it into voltmeter having a range of 0.100V?

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6. The combined resistance of a galvanometer of resistance 500Ω and its shunt is 21Ω. Calculate the value of shunt.

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7. A potentiometer wire has a resistance per unit length of $0.1\Omega/m$. A cell of emf 1.5V balance against 300 cm length of the wire. Find the current through potentiometer wire.

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8. Resistance of potentiometer wire is $0.1\Omega/cm$. A cell of emf 1.5V is balanced at 300cm on this potentiometer wire. Calculate the current and balancing length for another

cell of emf 1.4V on the same potentiometer wire.

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9. In a balanced meterbridge, the segment of wire opposite to 20Ω is 40cm. Calculate the unknown resistance.

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10. A uniform wire is cut into two pieces such that on piece is twice as long as the other. The two piece are connected in parallel in the left gap of a meterbridge. When a resistance of 20Ω is connected in the right gap, the null point is obtained at a distance of 60cm from the right end of the wire. Find the resistance of the wire before it was cut into two pieces.

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11. Two coils are connected in series in one gap of the meterbridge and null point is obtained of the middle of the wire by putting 75Ω in the other gap. Two coils are then connected in parallel and the null point is obtained again at the middle of the wire when the resistance in the other gap is changed by 57Ω. Find the resistance of each coil.

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12. A skeleton tube is made of 12 wires each of resistance $R\Omega$ is connected to a cell of emf E and of negotiable internal resistance. Use Kirchhoff's laws to find the resistance between:- diagonally opposite corners of the cube.

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13. A skeleton tube is made of 12 wires each of resistance $R\Omega$ is connected to a cell of emf E

and of negotiable internal resistance. Use Kirchhoff's laws to find the resistance between:- diagonally opposite corners of the cube.

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14. A skeleton tube is made of 12 wires each of resistance $R\Omega$ is connected to a cell of emf E and of negotiable internal resistance. Use Kirchhoff's laws to find the resistance

between:- diagonally opposite corners of the same face of the cube is across face diagonal.

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15. A galvanometer has resistance of 25Ω capacity to carry a maximum current of 25mA. How can it be used as ammeter to read the current upto 0.1 A?

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16. At what point the null point be obtained in meterbridge experiment when the ratio of resistance in two gaps is $3:7$?

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17. The potentiometer wire has length 10m and resistance 10Ω, if the current flowing through it is 0.4A, what are the balancing lengths when two cells of emfs 1.3V and 1.1V are connected so as to:- assist and

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18. The potentiometer wire has length 10m and resistance 10Ω, if the current flowing through it is 0.4A, what are the balancing lengths when two cells of emfs 1.3V and 1.1V are connected so as to:- oppose each other?

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19. When a resister of 10Ω is connected across a cell, its terminal potential difference is

balanced by 150cm of potentiometer wire and when 20Ω resistance is connected across the cell, terminal potential difference is balanced by 175cm of the same potentiometer wire. Find the balancing length when the cell is in open circuit and also find the internal resistance of the cell.

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20. Two cells having unknown emfs E_1 and E_2 $(E_1 > E_2)$ are connected in potentiometer

circuit so as to assist each other. The null point is obtained at 8.125m from higher potential end. When cell E_2 is connected so as to oppose cell E_1, the null point is obtained at 1.25m from the same end compare the emfs of two cells.

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21. A potentiometer wire has a length of 2m and resistance 10Ω. It is connected in series with resistance 990Ω and a cell of emf 2V.

Calculate the potential gradient along the wire.

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22. Four resistance 4,4,4 and 12Ω form a Wheatstone's network. Find the resistance when connected across 12Ω resistance will balance the network?

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23. Two resistance x and y in the two gaps of a meter bridge give a null point dividing the wire in the ratio $2:3$. If each resistance is increased by 30Ω,the null point divides the wire in the ratio $5:6$. calculate each resistance.

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24. Three cells are connected in parallel with their like poles connected together with wires of negligible resistance. The e.m.f. of the cells

are 2V, 3V and 4V respectively and their internal resistances are 1Ω, 2Ω and 3Ω, respectively. Find the current through each branch.

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25. The unknown resistance is placed in a left gap and a resistance of 50Ω in right gap of meter bridge. The null point is obtained at 60 cm from the right gap. Determine the unknown resistance.

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26. In a meter bridge experiment, the unknown resistance X in the left gap and a known resistance of 60Ω in right gap, null point is obtained at l cm from left. If the unknown resistance X is shunted by an equal resistance, what should be the value of known resistance in the right gap in order to get the null point at the same place?

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27. Select and wrote only the correct answer in words alongwith the alphabet of the following questions:- Kirchhoff's first law, i.e., $\sum l = 0$ at a junction, deals with the conservation of?

A. charge

B. energy

C. momentum

D. mass

Answer:

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28. When the balance point is obtained in the potentiometer, a current is drawn from?

A. both the cells and auxiliary battery

B. cell only

C. auxiliary battery only

D. neither cell nor auxiliary battery

Answer:

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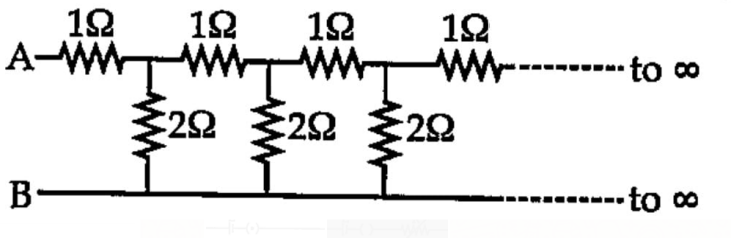
29. In the following circuit diagram , an infinite series of resistance is shown . Equivalent resistance between points A and B is



A. infinite

B. zero

C. 2Ω

D. 1.5Ω

Answer:

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30. Four resistances 10Ω, 10Ω, 10Ω and 15Ω form a Wheatstone's network. What shunt is required across 15Ω resistor to balance the bridge

A. 10Ω

B. 15Ω

C. 20Ω

D. 30Ω

Answer:

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31. A circular loop has a resistance of 40Ω. Two points P and Q of the loop, which are one quarter of the circumference apart are connected to a 24V battery, having an internal resistance of 0.5Ω. What is the current flowing through the battery.

A. 0.5 A

B. 1A

C. 2A

D. 3A

Answer:

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32. To find the resistance of a gold bangle, two diametrically opposite points of the bangle are connected to the two terminals of the left

gap of a metre bridge. A resistance of 4Ω is introduced in the right gap. What is the resistance of the bangle if the null point is at 20 cm from the left end?.

A. 2Ω

B. 4Ω

C. 8Ω

D. 16Ω

Answer:

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33. Kirchhoff's second law is the consequence of law of conservation of ..... .

A. mass

B. energy

C. charge

D. momentum

Answer:

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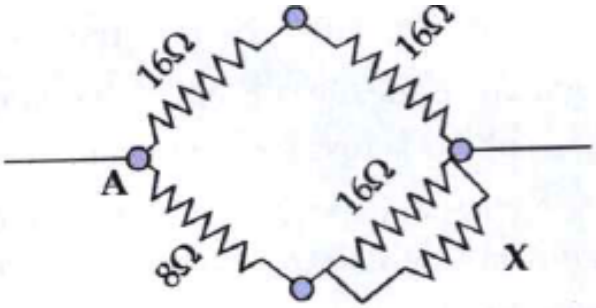
34. For given Wheatstone's network for being balanced, the value of resistance should be ..... .



A. 4Ω

B. 8Ω

C. 12Ω

D. 16Ω

Answer:

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35. In the measurement of resistance by meter bridge, the end error can be eliminated by ..... .

A. the null point should be near the centre of the wire.

B. by not interchanging the gaps for resistors.

C. the null point should be obtained at the ends of the wire.

D. both (b) and (c)

Answer:

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36. E.m.f. can be measured by

A. Voltmeter

B. Potentiometer

C. Galvanometer

D. Ammeter

Answer:

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37. The formula for internal resistance of a cell

A. $R\left(\frac{l_2 - l_1}{l_2}\right)$

B. $R\left(\frac{l_1 - l_2}{l_2}\right)$

C. $R\left(\frac{l_1}{l_1 - l_2}\right)$

D. $R\left(\frac{l_2}{l_2 - l_1}\right)$

Answer:

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38. In a potentiometer experiment balancing for the first cell and second cell are 2.5 m and 2 m, respectively, when cells are used separately. Hence, $\frac{E_1}{E_2}$ is

A. 0.8

B. 1

C. 1.1

D. 1.25

Answer:

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39. Which of the following is S.I. unit of potential gradient?

A. V cm

B. V/cm

C. V/m

D. Vm

Answer:

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40. Length of potentiometer wire is 600 cm and a driving cell develop 6V potential difference across it. The potential gradient along the wire is?

A. $(0.1V)/m$

B. $(1V)/m$

C. $(6V)/m$

D. $(0.9V)/m$

Answer:

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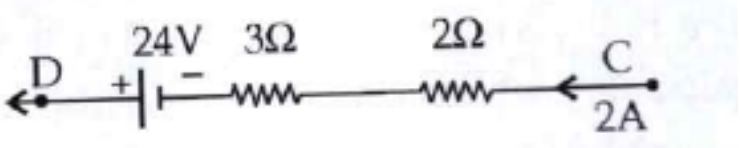
41. The potential difference $V_C - V_D$ between the points D and C in the following diagram is



A. 0V

B. 1.4V

C. 14V

D. 16V

Answer:

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42. Two unknown resistrance X and Y are connected to left and right gaps of a meter bridge and the balancing point is obtained at 80 cm from left. When a 10Ω resistance is connected in parallel to x, the balance point is 50 cm from left. The values of X and Y respectively are

A. 40Ω , 9Ω

B. 30Ω , 7.5Ω

C. 20Ω , 6Ω

D. 10Ω , 3Ω

Answer:

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43. In a balanced Wheatstone's bridge, if the position of the galvanometer and cell is interchanged then the balanced condition will

A. change

B. depends upon resistance of galvanometer

C. remain same

D. depends upon internal resistance of a cell

Answer:

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44. A battery having e.m.f. 5V and internal resistance 0.5 is connected with a resistance of 4.5Ω, then the voltage at the terminals of the battery is

A. 0 V

B. 4V

C. 4.5 V

D. ∞

Answer:

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45. A cell supplies a current 1.2A through a resistor 2Ω. The same cell supplies a current 0.4A through a 7Ω resistor. The internal resistance of the cell is

A. 0.1Ω

B. 0.3Ω

C. 0.5Ω

D. 0.7Ω

Answer:

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46. A voltmeter having a resistance of 50Ω is connected across a cell of e.m.f. 2V and internal resistance 10Ω. The reading of the voltmeter,

A. 0.167V

B. 1.667V

C. 16.7V

D. 967V

Answer:

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47. The length and cross-section of the wire of meter bridge are

A. 0.5 m and non-uniform

B. 0.5 m and uniform

C. 1 m and non-uniform

D. 1 m and uniform

Answer:

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48. The balance point is obtained at 40 cm from left end in meter bridge. Then the ratio of resistance in the gap is

A. $2:5$

B. $2:4$

C. $2:3$

D. $2:1$

Answer:

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49. Kelvin's method of determination of resistance of galvanometer

A. equals deflection method

B. equals null method

C. equals distance method

D. equals length method

Answer:

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50. Accuracy of potentiometer can be easily increased by

A. increasing resistance of wire

B. decreasing resistance of wire

C. increasing length of wire

D. decreasing the length of wire

Answer:

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51. A potential difference 3V is applied across a potentiometer wire of length 10 m. If the length of wire is reduced by 1 m the value of potential gradient in V/m will be

A. $0.0333V/m$

B. $0.333V/m$

C. $3.33V/m$

D. $33.3V/m$

Answer:

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52. A cell of internal resistance "r" is connected to an external resistance "R". p.d. will be maximum across "R" if

A. $R = r/2$

B. R=r

C. Rltr

D. Rgtr

Answer:

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53. A Wheatstone's bridge ABCD is balanced with a galvanometer between the points B and D. At balance, the potential at B and D.

A. $V_B = V_D$

B. $V_B < V_D$

C. $V_B > V_D$

D. $V_B = 2V_D$

Answer:

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54. Kirchhoffs voltage law and current law are respectively in accordance with the conservation of

A. charge and momentum

B. charge and energy

C. energy and charge

D. energy and momentum

Answer:

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55. A skeleton cube is made of 12 wires, each of resistance R. The resistance between any two adjacent comers of the cube is

A. $\frac{5}{12}R$

B. $\frac{6}{12}R$

C. $\frac{7}{12}R$

D. $\frac{8}{12}R$

Answer:

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56. When unknown resistance is determined by meterbridge the error due to contact resistance is minimized

A. by connecting both the resistance only in one gap

B. By interchanging the position of known and unknown resistance

C. by using uniform wire

D. by obtaining the null point near the end of the wire.

Answer:

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57. In potentiometer experiment, if l_1 is the balancing length for emf of cell of internal resistance r and l_2 is the balancing length for its terminal potential difference when shunted with resistance R then

A. $l_1 = l_2\left(\frac{R+r}{R}\right)$

B. $l_1 = l_2\left(\frac{R}{R+r}\right)$

C. $l_1 = l_2\left(\frac{R}{R-r}\right)$

D. $l_1 = l_2\left(\frac{R-r}{R}\right)$

Answer:

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58. An ideal ammeter has

A. zero resistance

B. low resistance

C. high resistance

D. infinite resistance

Answer:

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59. Which of the following statement is true?

A. A galvanometer with low resistance in parallel is an ammeter.

B. A galvanometer with high resistance in series is an ammeter.

C. A galvanometer with high resistance in parallel is a voltmeter.

D. A galvanometer with low resistance in parallel is a voltmeter.

Answer:

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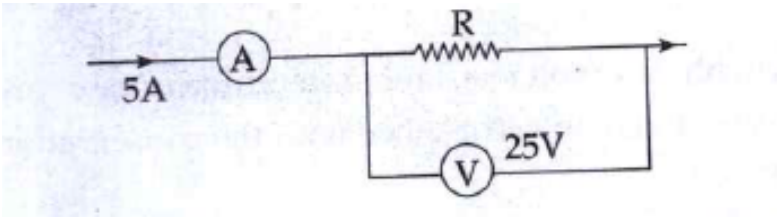
60. In the following circuit the value of resistance R



A. 5Ω

B. 20Ω

C. 30Ω

D. 125Ω

Answer:

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61. The deflection in moving coil galvanometer is reduced to half when it is shunted with 50Ω resistance. The resistance of galvanometer is

A. 1.25Ω

B. 25Ω

C. 50Ω

D. 100Ω

Answer:

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62. If galvanometer is shunted by $\left(\frac{1}{n}\right)^t h$ resistance, then the the fraction of current passing through the galvanometer will be

A. $\frac{n}{n+1}$

B. $\frac{n}{n+1}$

C. $\frac{1}{n+1}$

D. $\frac{n+1}{n}$

Answer:

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63. An ideal voltmeter has

A. zero resistance

B. zero resistance

C. high resistance

D. infinite resistance

Answer:

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64. The resistance of a galvanometer is G. If S is the resistance used to convert galvanometer into ammeter then the effective resistance of ammeter is

A. G-S

B. G+S

C. $\frac{G+S}{G}S$

D. $G\frac{S}{G+S}$

Answer:

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65. A moving coil galvanometer of resistance G gives full scale deflection for a certain current.

The shunt resistance required to convert it to measure a current n times the initial current is

A. $\frac{n-1}{G}$

B. $\frac{G}{n-1}$

C. $(n-1)G$

D. nG

Answer:

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66. The range of an ammeter can be increased by

A. connecting a small resistance in series

B. connecting a large resistance in series

C. decreasing the shunt resistance

D. increasing the shunt resistance

Answer:

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67. The range of a voltmeter can be increased by

A. connecting a law shunt resistance

B. connecting a high shunt resistance

C. decreasing the series resistance

D. increasing the series resistance

Answer:

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68. In the circuit given below, the equivalent resistance between point A and C is

A. 4Ω

B. greater than that between points A and D

C. less than that between points A and D

D. equal to that between points A and D

Answer:

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69. In a Wheatstone's network, the resistance in cycle order are P = 10Ω, $Q = 5\Omega$, S = 4Ω and R = 4Ω then for the bridge to balance.

A. 5Ω should be connected in parallel with Q = 5Ω

B. 10Ω should be connected in series with Q = 5Ω

C. 5Ω should be connected in series with P = 10Ω

D. 10Ω= should be connected in parallel with p = 10Ω

Answer:

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70. A lead resistance R is connected across a cell of emf E and internal resistance r. If the closed circuit p.d. across the terminals of the cell is V the internal resistance of the cell is.

A. $(E - V)R$

B. $(V - E)R$

C. $\left(\frac{E - V}{V}\right)R$

D. $\frac{E - V}{R}$

Answer:

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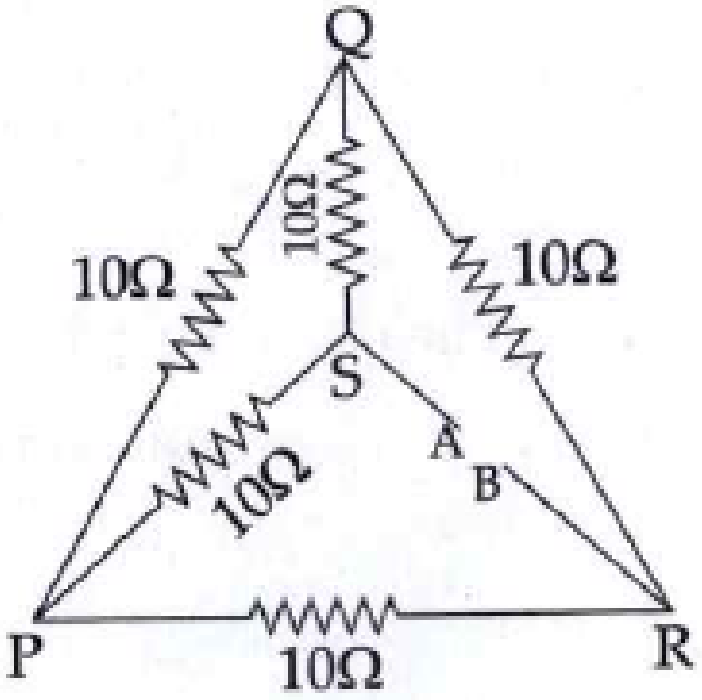
71. In the following circuit the equivalent resistance between A and B is

10 Ω

20 Ω

30 Ω

40 Ω



A. 10Ω

B. 20Ω

C. 30Ω

D. 40Ω

Answer:

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72. The material of wire of potentiometer is

A. copper

B. steel

C. manganese

D. aluminium

Answer:

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73. Length of potentiometer wire is 600 cm and a driving cell develop 6V potential difference across it. The potential gradient along the wire is?

A. VI

B. Kl

C. IRI

D. $\frac{I}{RI}$

Answer:

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74. The algebraic sum of current at junction in any electric circuit is equal to

A. zero

B. a positive integer

C. infinity

D. arbitrary

Answer:

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75. Which of the following instruments in generally used with a galvanometer to show null reading?

A. Ammeter

B. voltmeter

C. multimeter

D. meterbridge

Answer:

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76. A Wheatstone's bridge ABCD is balanced with a galvanometer between the points B and

D. At balance, the ..... between the points B and D is zero.

A. Resistance

B. current

C. voltage

D. B and C

Answer:

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77. The emf of a cell is E volt and internal resistance is r ohm. It resistance in the external circuit is r ohm, the p.d. across the cell will be

A. $\frac{E}{4}$

B. $\frac{E}{2}$

C. 2E

D. 4E

Answer:

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78. State the principle of potentiometer.

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79. Write down the equation for thermo emf when cold junction is at $0^{\circ}C$ and the hot junction is at $T^{\circ}C$.

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80. A cell of emf 1.1 V and internal resistance r is connected across as external resister of resistance 10r. Find the potential difference across the external resistor.

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81. State any two advantages of potentiometer over voltmeter.

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82. Distinguish between ammeter and voltmeter, (any two points).

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83. If V = $n_v V_g$ then show that X = G$(n_v - 1)$.

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84. Define potential gradient. State its unit and dimension.

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85. Four resistances 4Ω, 8Ω, $x\Omega$ and 6Ω are connected in the cyclic so as to form a Wheatstone network. Determine the value of x if network is balanced.

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86. If a galvanometer is shunted by one third of its resistance, find the fraction of total current passing through the galvanometer.

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87. Explain:- Thermo emf

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88. Explain:- see back effect

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89. Explain:- Thermocouple.

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90. State any three sources of error in meterbridge experiment and steps to be taken to minimise them.

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91. With a resistance R_1 in the left gap and a resistance R_2 in the right gap of a meterbridge, the null point is obtained at a

distance of 70cm from the left end, when R_1 is reduced by 2Ω and R_2 is increased by 2Ω, the null point is obtained at 30cm from left end. Find the values of resistance R_1 and R_2.

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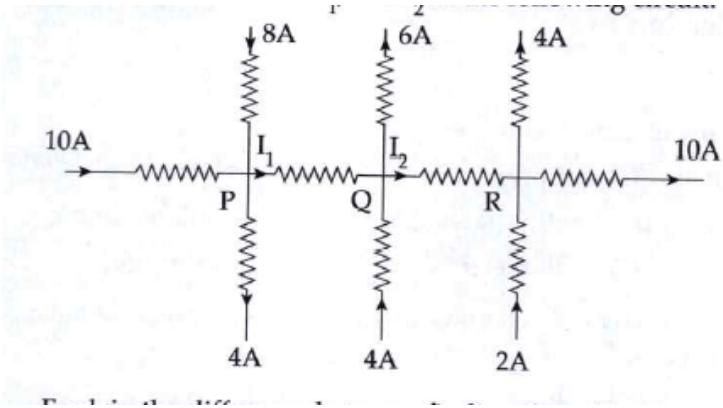
92. State Kirchoff's laws in electricity:- Calculate the value of I_1 and I_2 in the

following circuit.



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