PHYSICS

RESONANCE ENGLISH

CURRENT ELECTRICITY

Exercise

1. Specific resistance of a wire depends on the

A. mass

B. length

C. area of cross-section

D. none of these

Answer: D

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2. The electric current passes through a metallic wire produces heat because of :

A. collisions of conduction electrons with each other

B. collisions of the atoms of the metal with each other

C. the energy released in the ionization of the atoms of the metal

D. collisions of the conduction electrons with the atoms of the metallic wire

Answer: D

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3. For a metallic wire, the ratio $\frac{V}{i}$ ($V =$ applied potential difference and $i =$ current flowing) is

A. independent of temperature

B. increases as the temperature rises

C. decreases as the temperature rises

D. increases or decreases as the temperature rises depending upon the metal

Answer: B

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4. If on applying the potential of 20V on a conductor its conductance becomes $8(\Omega)^{-1}$, then the current flowing through it will be:

A. 120A

B. 160A

C. 90A

D. 80A

Answer: B

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5. The wires of same dimension but resistivities ρ_1 and ρ_2 are connected in series . The equivalent resistivity of the combination is

A. $\rho_1 + \rho_2$

B. $1/2(\rho_1 + \rho_2)$

C. $\sqrt{\rho_1 \rho_2}$

D. $2(\rho_1 + \rho_2)$

Answer: B

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6. The dimensions of a block are $1cm \times 1cm \times 100cm$. If the specific resistance of its material is $2 \times 10^{-7} ohm \times metre$, then the resistance between the opposite rectangular faces is

A. $2 \times 10^{-9}\Omega$

B. $2 \times 10^{-7}\Omega$

C. $2 \times 10^{-5}\Omega$

D. $2 \times 10^{-3}\Omega$

Answer: B

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7. When a resistance wire is passed through a die the cross-section area decreases by 1%, the change in resistance of the wire is

A. 1% decreases

B. 1% increases

C. 2% decreases

D. 2% increases

Answer: D

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8. When the resistance of copper wire is 0.1Ω and the radius is 1mm, then the length of the wire is (specific resistance of copper is $3.14 \times 10^{-8} ohm \times m$)

A. 10 cm

B. 10 m

C. 100 m

D. 100 cm

Answer: B

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9. A wire is stretched to n times its length. Then the resistance now will be increase by

A. n times

B. 1/n times

C. n^2 times

D. $1/n^2$ times

Answer: C

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10. The specific resistance of a conductor increases with

A. increases in temperature

B. increases in cross-sectional area

C. decreases in length

D. decreases in cross-sectional area

Answer: A

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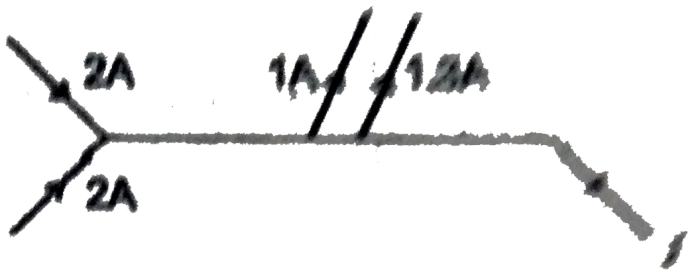
11. The value of current I in the circuit will be



A. $1.7A$

B. 2.1A

C. 3A

D. zero

Answer: A

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12. Three wires each have resistance 2Ω, if we connect 2 in series with one parallel to the combination the equivalent resistance is

A. $4/3\Omega$

B. $3/4\Omega$

C. 6Ω

D. 3Ω

Answer: A

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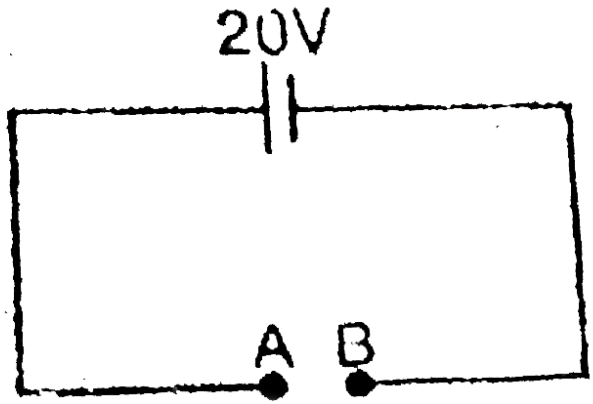
13. In the shown circuit, what is the potential difference across A and B



A. 50 V

B. 45 V

C. 30 V

D. 20 V

Answer: D

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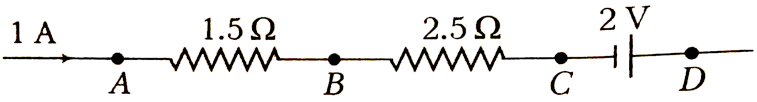
14. In the circuit element given here, if the potential at point B, $V_B = 0$, then the potentials of A and D are given as ltBrgt



A. $V_A = -1.5V, V_D = +2V$

B. $V_A = +1.5V, V_D = +2V$

C. $V_A = +1.5V, V_D = +0.5V$

D. $V_A = +1.5V, V_D = -0.5V$

Answer: D

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15. A cell has and emf 1.5 V . When connected across an external resistance of 2Ω, the

terminal potential difference falls to 1.0V. The internal resistance of the cell is

A. 2Ω

B. 1.52Ω

C. 1.0Ω

D. 0.5Ω

Answer: C

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16. Two bulbs $25W, 220V$ and $100W, 220V$ are given . Which has higher resistance ?

A. 25 w bulb

B. 100 W bulb

C. both bulbs will have equal resistance

D. resistance of bulbs cannot be compared

Answer: A

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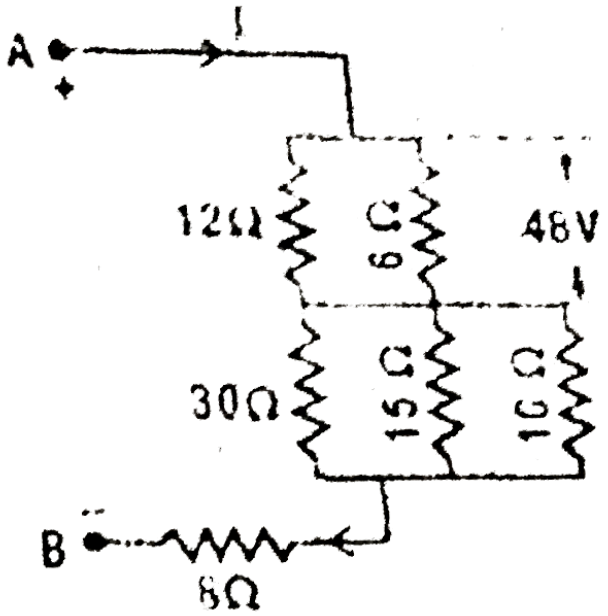
17. In the figure the potential difference across 6 ohm resistor is 48 V. Then the potential difference between A and B is



A. 48 V

B. 102 V

C. 204V

D. can't be determined

Answer: C

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18. The total power dissipated in watts in the circuit shown here is

A. 4W

B. 16 W

C. 40 W

D. 54 W

Answer: D

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19. A student measures the terminal potential difference (V) of a cell (of emf ε and internal resistance r) as a function fo the current (I) folwing through it . The slope and intercept of

the graph between V and I, respectively, equal to

A. ε and -r

B. $-r$ and ε

C. r and $-\varepsilon$

D. $-\varepsilon$ and r

Answer: B

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20. One filament takes 10min to heat a kettle and another takes 15 min. If connected in parallel they combindly take.....min to heat the same kettle:

A. 6

B. 12.5

C. 25

D. 7.5

Answer: A

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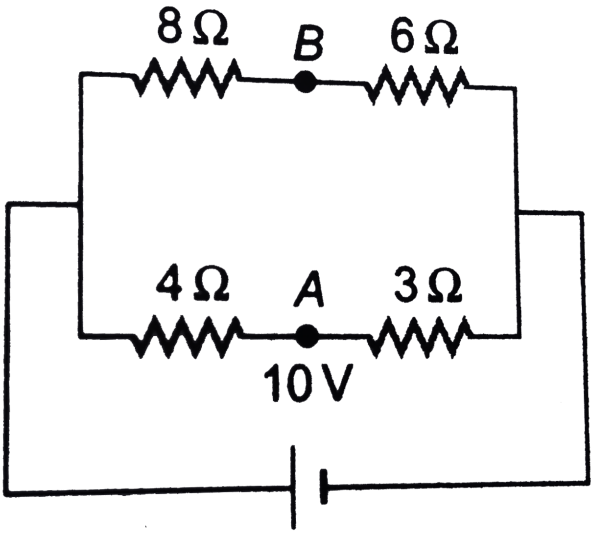
21. The potential difference between points A and B is



A. $\frac{20}{7}V$

B. $\frac{40}{7}V$

C. $\frac{10}{7}V$

D. zero

Answer: D

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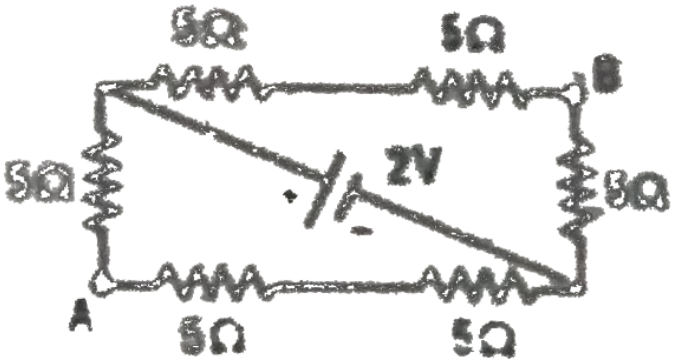
22. The potential difference between the point

A and B in figure will be



A. $\frac{2}{3}V$

B. $\frac{8}{9}V$

C. $\frac{4}{3}V$

D. 2V

Answer: A

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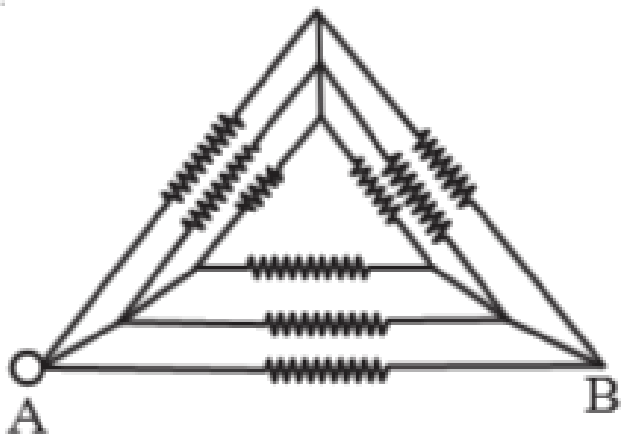
23. Nine resistors each of resistance R are connected in the circuit as shown in figure. The net resistance between A and B is



A. R

B. $\frac{7R}{6}$

C. $\frac{3R}{5}$

D. $\frac{2R}{9}$

Answer: D

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24. A wire having resistance 12Ω is bent in the from of an equilateral triangle. The effective resistance between any two corners of the triangle will be

A. $8/3$

B. $3/4$

C. 4

D. 3

Answer: A

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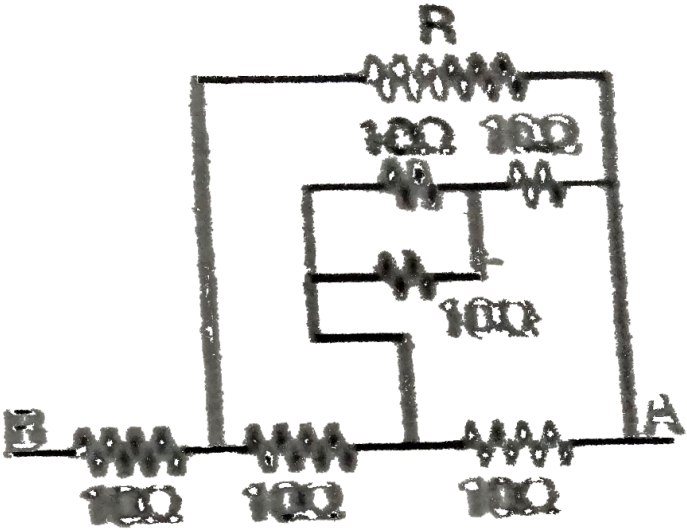
25. For the network of resistance shown in the figure the equivalent resistance of the network between the points A and B is 18 ohm. The

value of unknown resistance R is :



A. 8Ω

B. 10Ω

C. 16Ω

D. 24Ω

Answer: C

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26. When a wire of uniform cross-section a , length l and resistance R is bent into a complete circle, resistance between two of diametrically opposite points will be

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

B. $\frac{R}{8}$

C. 4R

D. $\frac{R}{2}$

Answer: A

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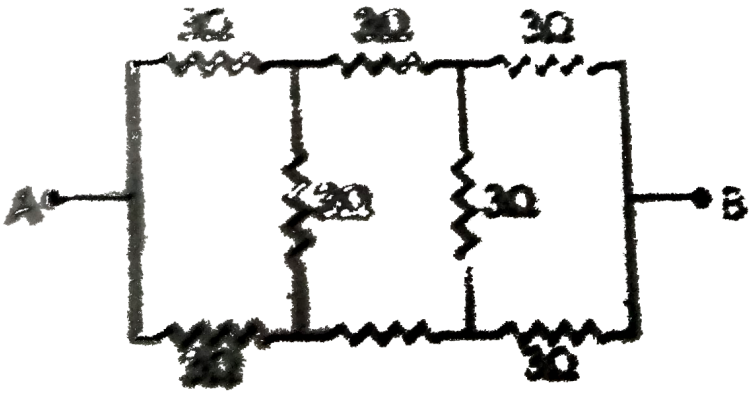
27. Calculate the equivalent resistance between A and B



A. $9/2\Omega$

B. 3Ω

C. 6Ω

D. $5/3\Omega$

Answer: A

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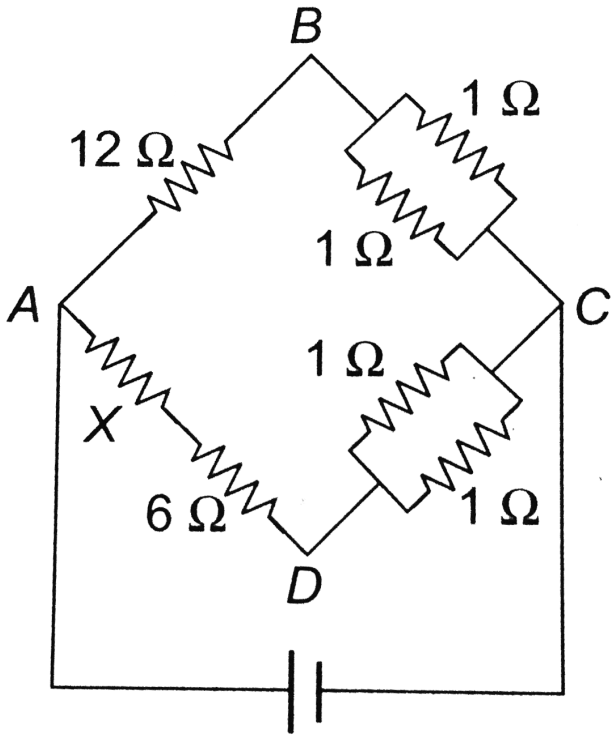
28. For what value of unknown resistance X, the potential difference between B and D will

be zero in the circuit shown in the figure ?



A. 4 ohm

B. 2 ohm

C. 3 ohm

D. 6 ohm

Answer: D

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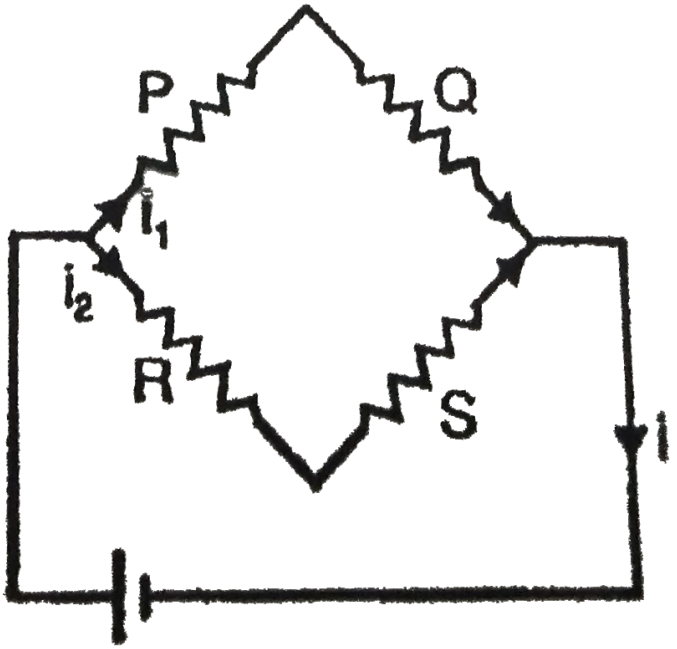
29. The value of i_1 / i_2 for a given diagram is



A. $\dfrac{P+Q}{R-S}$

B. $\dfrac{R+S}{P+Q}$

C. $\dfrac{P+Q}{R+S}$

D. $\frac{R+S}{P-Q}$

Answer: B

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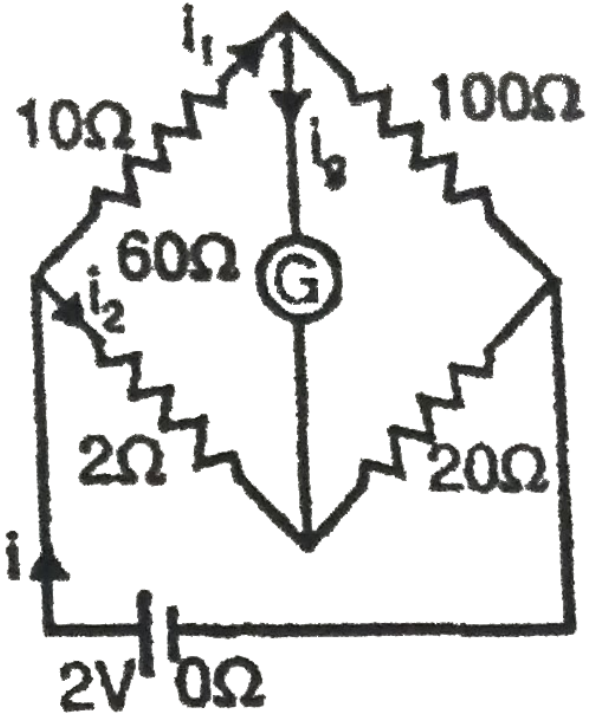
30. In the circuit shown below the resistance of the galvanometer is 20Ω. In which case of the following alternatives are the currents

arranged strictly in the decreasing order



A. i, i_1, i_2, i_g

B. i, i_2, i_1, i_g

C. i, i_1, i_g, i_1

D. i, i_1, i_g, i_2

Answer: B

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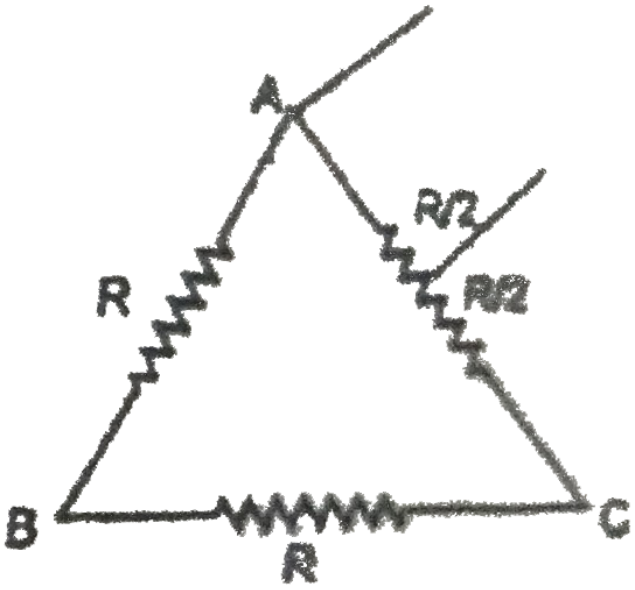
31. A wire is bent in the form of a triangle now the equivalent resistance between its one end

and the mid point of the side is



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

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

C. $\frac{3R}{12}$

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

Answer: A

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32. n equal cell having emf E and internal resistance r, are connected in circuit of a resistance R. Same current flows in circuit either they connected in series or parallel, if:

A. R=nr

B. $R = \frac{r}{n}$

C. $R = n^2 r$

D. R=r

Answer: D

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33. An unknown resistance R is connected in series with a 2-ohm resistance. A current is flowing in this combination. The balancing length for potential difference across 2-ohm resistor, in a potentiometer experiment is found to be 300 cm, while the balancing

length for the potential difference across the unknown R is found to be 360 cm. The unknown resistance R is

A. 2.4 ohm

B. 3.0 ohm

C. 3.6 ohm

D. 6.6 ohm

Answer: A

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34. A current of 2amp is flowing in the primary circuit of a potentiometer wire having resistance of $0.2ohm/m$. In a coil when current of 1A flows, then potential difference across its terminals are balanced at 2.5m of the potentiometer wire. The resistance of the coil is

A. 1 ohm

B. 2.5 ohm

C. 0.4 ohm

D. 5.0 ohm

Answer: A

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35. For the same potential difference, a potentiometer wire is replaced by another one of a high specific resistance. The potential gradient then ($r = R_h = 0$)

A. decreases

B. remains same

C. increases

D. data is incomplete

Answer: B

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36. If the current in a potentiometer increases, the position of the null point will

A. be obtained at a larger length than the previous one

B. be equal to the previous length

C. be obtained at a smaller length than the previous

D. none of these

Answer: C

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37. In a potentiometer wire, whose resistance in $0.5ohm/m$, a current of 2 amp is passing. The value of potential grandient in volt/m will be

A. 0.1

B. 0.5

C. 1.0

D. 4

Answer: C

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38. The potentiometer wire 10m long and 20 ogm resistance is connected to a 3 volt emf

battery and a 10ohm resistance. The value of potential gradient in volt/m of the wire will be

A. 1

B. 0.2

C. 0.1

D. 0.02

Answer: B

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39. The length of a potentiometer wire is 10m and a potential difference of 2 volt is applied to its ends. If the length of its wire is increased by 1m, the value of potential gradient in volt/m will be (potential difference across potentiometer wire remain same)

A. 0.18

B. 0.22

C. 1.3

D. 0.9

Answer: A

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40. The potential gradient of potentiometer is $0.2\text{volt}/m$. A current of 0.1 amp is flowing throgh a coil of 2 ohm resistance. The balancing length in meters for the potential difference at the ends of this coil will be

A. 2

B. 1

C. 0.2

D. 0.1

Answer: B

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41. The emf of a standard cell is 1.5 volt and its balancing length is 7.5 m. The balancing length in meters for a 3.5 ohm resistance, through which a current of 0.2 A, flows will be

A. 3.5

B. 5

C. 5.7

D. 6.5

Answer: A

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42. The resistance of a galvanometer coil is R. What is the shunt resistance required to convert it into an ammeter of range 4 times

A. R/5

B. R/4

C. R/3

D. 4R

Answer: C

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43. For measurement of potential difference, potentiometer is preferred in comparison to voltmeter because

A. It has a wire of high resistance

B. It has a wire of low resistance

C. It does not draw current from external circuit

D. It draws a heavy current from external circuit

Answer: C

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44. Resistivity of potentiometer wire is $10^{-7}\Omega - m$ and its area of cross-section is $10^{-6}\Omega m^2$. When a current i=0.1A flows through the wire, its potential gradient is

A. $10^{-2}V/m$

B. $10^{-4}V/m$

C. 0.1 V/m

D. 10 V/m

Answer: A

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45. In electrolysis the mass deposited on an electrode is directly proportional to

A. Current

B. Square of current

C. Concentration of solution

D. inverse of current

Answer: A

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46. An ammeter and a voltmeter are joined in series to a cell. Their readings are A and V, respectively. If a resistnace is now joined in parallel with the voltmeter

A. both A and V will increase

B. both A and V will decreases

C. A will decreases, V will increases

D. A will increases, V will decreases

Answer: D

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47. The resistanca of an ammeter is 13Ω and its scale is graduated for a current upto 100 connected to this ammeter it becomes possible to measure currents upto 750 A by this meter. The value fo shunt resistance is

A. 20Ω

B. 2Ω

C. 0.2Ω

D. $2k\Omega$

Answer: B

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48. Three resistances P, Q, R each of 2Ω and an unknown resistance S form the four arms of a Wheatstone's bridge circuit. When a resistance of 6Ω is connected in parallel to S, the bridge gets balanced. What is the value of S?

A. 2Ω

B. 3Ω

C. 6Ω

D. 1Ω

Answer: B

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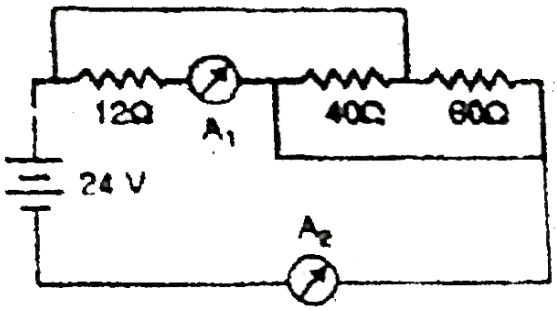
49. In the circuit of figure A_1 and A_2 are ideal ammeters. Then the reading in ammeter A_2 is



A. 0.4A

B. 0.6A

C. 2.0A

D. 3.0A

Answer: D

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50. There is a voltmeter in a circuit. In order to triple its range, the resistance of how much value should be used?

A. 2R

B. R/2

C. 3R

D. 4R

Answer: A

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51. Sensitivity of a potentiometer can be incresed by

A. increasing the emf of the cell

B. increasing the length of the potentiometer wire

C. decreasing the length of the potentiometer wire

D. None of the above

Answer: B

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52. STATEMENT 1: The current density $\vec{J}$ at any point in ohmic resistor is in direction of electric field $\vec{E}$ at that point .

STATEMENT 2: A point charge when released from rest in a region having only electrostatic field always moves along electric lines of force.

A. Statement-1 is true, Statement-2: is true, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is true, Statement-2: is true, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is true but statement-2 is false

D. Statement-1 is false, Statement-2 is true

Answer: C

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53. Statement-1 : In a Meter Bridge experiment, null point for an unknown resistance is measured. Now, the unknown resistance is put inside an enclosure maintained at a higher temperature. The null point can be obtained at the same point as before by decreasing the value of the standard resistance.

Statement-2 : Resistance of metal increases with increase in temperature.

A. Statement-1 is true, Statement-2: is true, Statement-2 is a correct explanation for

Statement-1.

B. Statement-1 is true, Statement-2: is true, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is true but statement-2 is false

D. Statement-1 is false, Statement-2 is true

Answer: D

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