

India's Number 1 Education App

## PHYSICS

## **BOOKS - DISHA PHYSICS (HINGLISH)**

## **CURRENT ELECTRICITY**



**1.** The voltmeter shown in fig, reads 6V across the  $60\Omega$  resistor. Then the resistance of the

#### voltmeter is-



#### A. $0\Omega$

B.  $\infty \Omega$ 

#### $\mathsf{C.}\,200\Omega$

#### D. $300\Omega$

#### **Answer:**



2. If only one hundredth part of total current flowing in the circuit is to be passed through a galvanometer of resistance  $G\Omega$ , Then the value of shunt resistance required will be-

A. G/10

B. G/100

 $\mathsf{C.}\,G\,/\,99$ 

D. G/999



**3.** The shunt required for 10% of main current to be sent through the moving coil galvanometer of resistance  $99\Omega$  will be-

A.  $0.9\Omega$ 

 $\mathsf{B}.\,11\Omega$ 

 $C.90\Omega$ 

D.  $9.9\Omega$ 



**4.** The reading of voltmeter in the following circuit will be-



B. 0.80 volt

C. 1.33 volt

D. 1.60 volt

#### Answer:

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5. The figure below shows current in a part of

electric circuit. The current i is



A. 1.7 amp

B. 3.7 amp

C. 1.3 amp

D.1 amp

#### Answer:



**6.** A voltmeter can measure upto 25 volt and its resistance is  $1000\Omega$ . The resistance required to add with voltmeter to measure upto 250 volt will be-

Α. 9000Ω

 $\mathsf{B}.\,1000\Omega$ 

 $\mathsf{C.}\,2500\Omega$ 

D.  $900\Omega$ 

Answer: A

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7. When a Laclanche cell is connected to a  $10\Omega$ resistance then a current of 0.25 ampere flows in the circuit. If the resistance is reduced to  $4\Omega$ then current becomes 0.5ampere. The internal resistance of galvanometer will be-

A.  $1.5\Omega$ 

 $\mathsf{B}.\,0.5\Omega$ 

 $\mathsf{C}.\,1\Omega$ 

D.  $2\Omega$ 



## **8.** Consider the circuit shown in the figure. The current $I_3$ is equal to



A. 5A

#### $\mathsf{B.}\, 3A$

C. - 3A

$$\mathsf{D.}-5/6A$$

#### **Answer:**

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# **9.** If $V_{AB} = 4V$ in the given fig are, then resistance $\chi$ will be



A.  $5\Omega$ 

 $\mathsf{B.}\,10\Omega$ 

C.  $15\Omega$ 

D.  $20\Omega$ 

#### **Answer:**



#### **10.** In the given circuit the current $I_1$ is



A. 0.4A

- B. 0.4A
- $\mathsf{C.}\,0.8A$

D. - 0.8A



**11.** To get the maximum current from a parallel combination of n identical cells each of internal resistance r in an external resistance R, when

A. 
$$R > > r$$

 $\mathsf{B}.\, R < \ < r$ 

 $\mathsf{C}.\,R>r$ 

D. R=r

#### Answer:

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**12.** In the circuit shown below, if the value of R is increased then what will be the effect on the reading of ammeter if the internal resistance

#### of cell is negligible-



A. The reading of ammeter will decrease

B. The reading of ammeter will increase

C. The reading of ammeter will remain

unchanged

D. The reading of ammeter will become

zero.

#### **Answer:**



**13.** Twelve wire, each having resistance r, are joined to form a cube as shown in figure.Find the equivalent resistance between the end of

#### a face diagonal such as a and c.



#### A. 2 R

B. 12 R

$$\mathsf{C}.\,\frac{5}{6}R$$

#### D. 8 R



**14.** The arrangement as shown in figure is called as



A. Potential divider

**B.** Potential adder

#### C. Potential substracter

D. Potential multiplier

#### Answer:

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**15.** 5When a cell of emf E and internal resistance r, is connected to the ends of a resistance R, then current through resistance

is I. If the same cell is connected to the ends of

a resistance R/2 then the current would be-

A. less than I

B.I

C. greater then I but less than 2I

D. greater than 2I

Answer:

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16. The resistance of an ideal voltmeter is

A. Zero

B. Very low

C. Very large

D. Infinite

Answer:

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17. An ammeter with internal resistance  $90\Omega$  reads 1.85 A when connected in a circuit containing a battery and two resistors  $700\Omega$  and  $410\Omega$  in series. Actual current will be

A. 1.85A

B. Greater than 1.85 A

C. Less than 1.85 A

D. None of these

Answer:



**18.** The figure shows a network of currents. The magnitude of currents is shown here. The current I will be



#### A. 3A

#### $\mathsf{B.}\,9A$

 $\mathsf{C}.\,13A$ 

D. 19A

#### Answer:



#### 19. Kirchoff's laws are based on conservation of

- (1) charge
- (2) potential
- (3) energy
- (4) mass

- A. 1, 2 and 3 are correct
- B. 2 and 2 are correct
- C. 3 and 4 are correct
- D. 2 and 3 are correct



20. A microammeter has a resistance of 100W and a full scale range of 50  $\mu$ A. It can be used as a voltmeter or a higher range ammeter

provided a resistance is added to it. Pick the correct range and resistance combination(s). (1) 10V range with 200 kW resistance in series. (2) 50V range with 10 kW resistance in series. (3) 5 mA range with 10 kW resistance in parallel. (4) 10 mA range with 1 kW resistance in parallel.

A. 1, 2 and 3 are correct

B. 3 and 2 are correct

C. 4 and 4 are correct

D. 3 and 3 are correct



**21.** A 6V battery of negligible internal resistance is connected across a uniform wire AB of length 100cm. The positive terminal of another battery of emf 4V and internal resistance  $1\Omega$  is joined to the point A as shown in figure. Take the potential at B to be zero.



2What are the potentials at points A and C?

A. 6V, 2V

B. 8V, 4 V

C. 6V, 4V

D. 8V, 3V

#### **Answer:**



22. A 6V battery of negligible internasl resistance is connected across a uniform wire AB of length 10cm. The positive terminal of another battery of emf 4V and internal resistance  $1\Omega$  is joined to the point A as shown in figure. Take the potentail at B to be zero.



a. What are the potential at the ponts A and C?

b. At which point D of the wire AB, the potential is equal to the potential at C? c. If the points C and D are connected by a wiere, what will be the current through it ? d. If the 4V battery is replaced by 7.5V battery, what would be the answer of parts (a) and (b)?

A. zero

 $\mathsf{B}.\,1A$ 

 $\mathsf{C.}\,2A$ 

D. 3A

#### **Answer:**

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**23.** Statement -1 : Voltameter measures current more accurately than ammeter. Statement -2 : Relative error will be small if measured from voltameter.

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 False, Statement-2 is

True.

D. Statement -1 is True, Statement-2 is

False.

Answer:

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24. Statement - 1 : A larger dry cell has higher

emf. Statement - 2 : The emf of a dry cell is

independent of its size.

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 False, Statement-2 is

True.

D. Statement -1 is True, Statement-2 is

False.



25. Statement - 1 : In the circuit shown,  $V_{ab}$  or  $V_a - V_b = 0$ , if

Statement - 2 : Potential difference across the terminals of a non ideal battery is less than its

emf when a current flows through it.

I = 2A


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 False, Statement-2 is

True.

D. Statement -1 is True, Statement-2 is

False.

## Answer:



**26.** Potentiometer wire of length 1m is connected in series with  $490\Omega$  resistance and 2V battery. If  $0.2m\frac{V}{c}m$  is the potential gradient, then resistance of the potentiameter wire is approximately

## A. $4.9\Omega$

#### $\mathsf{B}.\,7.9\Omega$

 $\mathsf{C}.5.9\Omega$ 

 $\mathsf{D.}\,6.9\Omega$ 

#### Answer:



27. Two resistances are connected in two gaps of a meter bridge. The balance point is 20cmfrom the zero end. A resistance of  $15\Omega$  is connected in series with the smaller of the two. The null point shifts to 40cm. The value of

the smaller resistance in  $\Omega$  is

A. 3

B. 6

C. 9

D. 12

#### Answer:



**28.** In a potentiometer experiment the balancing with a cell is at length 240 cm. On shunting the cell with a resistance of  $2\Omega$ , the balancing length becomes 120 cm.The internal resistance of the cell is

A.  $4\Omega$ 

 $\mathsf{B.}\,2\Omega$ 

 $\mathsf{C}.\,1\Omega$ 

D.  $0.5\Omega$ 

#### Answer:



**29.** A potentiometer consists of a wire of length 4 m and resistance  $10\Omega$ . If is connected of cell of emf 2V. The potential difference per unit length of the wire will be

A. 0.5V/m

 $\mathsf{B.}\,10V\,/\,m$ 

 $\operatorname{\mathsf{C.}} 2V/m$ 

D. 5V/m

## Answer:



**30.** In given figure, the potentiometer wire AB has a resistance of  $5\Omega$  and length 10 m . The balancing length AM for the emf of 0.4 V is



A. 0.4 m

B.4 m

C. 0.8 m

D. 8 m

**Answer:** 

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**31.** In the circuit shown in the figure, the current flowing in  $2\Omega$  resistance



## A. 1.4A

# $\mathsf{B}.\,1.2A$

 $\mathsf{C.}\,0.4A$ 

# $\mathsf{D}.\,1.0A$

## Answer:



**32.** For the post office arrangement to determine the value of unknown resistance, the unknown resistance should be connected between.



A. B and C

# B. C and D

C. A and D

D.  $B_1$  and  $C_1$ 

#### Answer:

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**33.** The e.m.f. of a standard cell balances across 150 cm length of a wire of potentiometer. When a resistance of  $2\Omega$  is connected as a shunt with the cell, the balance point is obtained at 100cm . The internal resistance of

the cell is

A.  $0.1\Omega$ 

 $\mathsf{B}.\,1\Omega$ 

 $\mathsf{C}.\,2\Omega$ 

 $\mathsf{D}.\,0.5\Omega$ 

#### Answer:



34. Five resistor are connected as shown in the

diagram. The equivalent resistance between  ${\cal A}$  and  ${\cal B}$  is



# A. $6\Omega$

## $\mathsf{B.}\,9\Omega$

# D. $15\Omega$

#### Answer:

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**35.** A potentiometer has uniform potential gradient. The specific resistance of the material of the potentiometer wire is  $10^{-7}$  ohm-meter and the current passing through it is 0.1 ampere, cross-section of the wire is

 $10^{-6}m^2$ . The potential gradient along the

potentiometer wire is

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

B. 
$$10^{-6} V / m$$

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

D. 
$$10^{-8}V/m$$

## Answer:



**36.** Resistance in the two gaps of a meter bridge are 10ohm and 30ohm respectively. If the resistances are interchanged he balance point shifts by

A. 33.3cm

B. 66.67 cm

C. 25 cm

D. 50 cm

**Answer:** 



**37.** A potentiometer has uniform potential gradient across it. Two cells connected in series (i) to support each other and (ii) to oppose each other are balanced over 6 m and 2 m respectively on the potentiometer wire. The e.m.f.'s of the cells are in the ratio of

A. 1:2

**B**. 1:1

**C**. 3:1

## D. 2:1

#### Answer:

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**38.** In a potentiometer experiment two cells of e.m.f. E and E are used in series and in conjunction and the balancing length is found to be 58 cm of the wire. If the olarity of E is reversed, then the balancing length becomes 29 cm . The ratio  ${E_1\over E_2}$  of the e.m.f. of the two

cells is

A. 1:1

B. 2:1

C.3:1

D. 4:1

# Answer:



**39.** The resistance of 10 metre long potentiometer wire is 1 ohm/meter . A cell of e.m.f. 2.2 volts and a high resistance box are connected in series to this wire. The value of resistance taken from resistance box for getting potential gradient of 2.2 millivolt/metre will be

A.  $790\Omega$ 

 $\mathsf{B.}\,810\Omega$ 

 $\mathsf{C}.\,990\Omega$ 

# D. $1000\Omega$

## Answer:





In the shown arrangement of the experiment of the meter bridge if AC corresponding to null deflection of galvanometer is x, what would be its value if the radius of the wire AB is doubled?

A. x

B. x/4

C. 4x

D. 2x

#### **Answer:**

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**41.** In meter brigde of Wheatstone bridge for measurment of resistance, the known and the unknown resistance are interchanged. The error so removed is

A. End correction

B. Indec error

C. Due to temperature effect

D. Random error

# Answer:

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**42.** Which of the following statements are correct ?

(1) Voltmeter should have high resistance.

(2) Ammeter should have low resistance.

(3) Voltmeter is placed in parallel across the conductor in a circuit.

(4) Ammeter is placed in parallel across the conductor in a circuit.

A. 1, 2 and 3 are correct

B. 1 and 2 are correct



D. 1 and 3 are correct

#### **Answer:**



**43.** Which are coorect statement ?

(1) The Wheatstone bridge is most sensitive when all the four resistances are of the same order

(2) Kirchhoffs first law (for currents meeting at

a junction in an electric circuit) expresses the

conservation of charge.

(3) The rheostat can be used as a potential divider.

(4) In a balanced Wheatstone bridge, interchanging the positions of galvanometer and cell affects the balance of the bridge.

A. 1, 2 and 3 are correct

B. 2 and 2 are correct

C. 3 and 4 are correct

D. 2 and 3 are correct

## Answer: A



**44.** Figure shows a balanced Wheatstone's bridge



(1) If P is slightly increased, the current in the

galvanometer flow from A to C.

(2) If P is slightly increased, the current in the

galvanometer flows C to A.

(3) If Q is slightly increased, the current in the

galvanometer flows from C to A.

(4) If Q is slightly increased, the current in the

galvanometer flows from A to C.

A. 1, 2 and 3 are correct

B. 3 and 2 are correct

C. 4 and 4 are correct

D. 3 and 3 are correct

## Answer:



**45.** A battery is connected to a potentiometer and a balance point is obtained at 84cm along the wire. When its terminals are connected by a  $5\Omega$  resistor, the balance point changes to 70cm.

Calculate the internal resistance of the cell.

A  $4\Omega$ 

 $\mathsf{B.}\,2\Omega$ 

C.  $5\Omega$ 

D.  $1\Omega$ 

## Answer:

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**46.** A battery is connected to a potentiometer and a balance point is obtained at 84cm along the wire. When its terminals are connected by a 5 $\Omega$  resistor, the balance point changes to 70cm.

Find the new position of the balance point when  $5\Omega$  resistor is changed by  $4\Omega$  resistor.

A. 26.5 cm

B. 52 cm

C. 67.2 cm

D. 83.3 cm

#### **Answer:**

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**47.** A battery is connected to a potentiometer and a balance point is obtained at 84cm along the wire. When its terminals are connected by a 5 $\Omega$  resistor, the balance point changes to 70cm.

Find the new position of the balance point when  $5\Omega$  resistor is changed by  $4\Omega$  resistor.

A. By adding a resistance  $9980\Omega$  in parallel

with the galvanometer

B. By adding a resistance  $9980\Omega$  in series

with the galvanometer

C. By adding a resistance  $8890\Omega$  in parallel

# with the galvanometer

D. By adding a resistance  $9980\Omega$  in series

with the galvanometer

#### **Answer:**

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48. Assertion : In metre bridge experiment, a

high resistance is always connected in series

with a galvanometer.

Reason : As resistance increases, current through the circuit increases,

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 False, Statement-2 is

True.

D. Statement -1 is True, Statement-2 is

False.

#### **Answer:**



49. Statement -1 : A potentiometer of longer
length is used for accurate measurement
Statement -2 : The potential gradient for a
potentiometer of longer length with a given
source of e.m.f becomes small

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 False, Statement-2 is

True.

D. Statement -1 is True, Statement-2 is

False.
### Answer:



**50.** Assertion : The e.m.f. of the drivercell in the potentiometer experiment should be greater than the e.m.f. of the cell to determined.

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 False, Statement-2 is

True.

D. Statement -1 is True, Statement-2 is

False.

**Answer:** 

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1. In the following fig. the ratio of current in  $3\Omega$ 

and  $1\Omega$  resistances is–



A. 43468

B. 43499

C. 1

D. 2

### **Answer:**



2. The resultant resistance between the points

A and B in the following fig. will be



A.  $4\Omega$ 

 $C.6\Omega$ 

D.  $2\Omega$ 

#### **Answer:**



**3.** How will the reading in the ammeter A of Fig. 6.39 be affected if another identical bulb Q is connected in parallel to P as shows. The voltage in the mains is maintained at a

### constant value.



A. the reading will be reduced to one half

B. the reading will be duuble to one

pervious one

C. the reading will not be affected

D. the reading will increase four fold

#### Answer:



**4.** In the circuit, the galvanometer G shows zero deflection. If the batteries A and b have negligible internal resistance, the value of the resistor R will be -



 $\mathsf{B}.\,100\Omega$ 

 $\mathrm{C.}\,200\Omega$ 

D.  $500\Omega$ 

### Answer:

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5. A cylindrical wire is stretched to increase its length by 10%. The percentage increase in the resistance of the wire will be–

A. 0.22

B. 0.21

C. 0.22

D. 0.24

Answer:

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**6.** In the figure, the equivalent resistance between A and B is-



# A. 2R/3

# B. R/3

# C. R

# D. 3 R

## Answer:



**7.** In the adjoining network of resistors, each is of resistance r ohm, the equivalent resistance

between points A and B is-



A. 5r

# B. 2r/3

C. r

D. r/2

### **Answer:**



# 8. In the figure a carbon resistor has bands of

different colours on its body as mentioned in

the figure. The value of the resistance is



A.  $2.2k\Omega$ 

#### B. $3.3k\Omega$

## $\mathsf{C.}\,5.6k\Omega$

## D. $9.1k\Omega$

#### Answer:



**9.** Two wires of same material have length L and 2 L and cross– sectional areas 4 A and A respectively. The ratio of their specific resistance would be

A. 0.04305555555556

B. 0.3340277777778

C. 1: 8

D.1:1

### Answer:



**10.** In the fig. shown, Calculate the current through 3 ohm resistor. The emf of battery is 2

volt and its internal resistance is 2/3 ohm.



A. 0.33 amp

B. 0.44

C. 1.22 apm

D. 0.88 apm

#### **Answer:**

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11. The current in the adjoining circuit will be





### **Answer:**



# 12. The equivalent resistance of the following

## infinite network of resistance is



## A. less then $4\Omega$

## $\mathsf{B.}\,4\Omega$

C. More then  $4\Omega$  but less then  $12\Omega$ 

D.  $12\Omega$ 

#### Answer:



**13.** A heater coil connected to a supply of a 220 V is dissipating some power .  $P_1$  The coil is cut into half and the two halves are connected in parallel. The heater now dissipates a power .  $P_2$  Theratio of power  $P_1: P_2$  is A. 2:1

B. 1:2

**C**. 1:4

D. 4:1

#### **Answer:**



14. An electric lamp is marked 60 W , 230 V . The cost of a 1 kWh of energy is Rs . 1.25. The

cost of using this lamp 8 hrs a day for 30 day

## is

A. Rs 10

B. Rs 16

C. Rs18

D. Rs20

#### Answer:



15. In the fig below the bulbs are identical, The

bulbs, light most brightly are



A. A

B. B

C. F

D. D

#### Answer:



**16.** An electric tea kettle has two heating coils. When one of the coils is switched on , boiling begins in 6 min . When the other coil is switched on , boiling begins in 8 min . In what time will the boiling begin if both coils are switched on simultaneously (i) in series and (ii) in parallel.

- A. 14 min in series
- B. 3.43 mi9n in parallel
- C. 3.43 min in series
- D. 14 min in parallel

#### **Answer:**

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17. For the circuit shown in the figure



- A. the potential different across  $R_L$  is 18 V
- B. The current I through the battery is 7.5

mA

C. Ratio of power dissipated in  $R_1$  and  $r_2$  is

maguitude of power dissipated in  $r_L$  will

decrease by a factor of 9

Answer:

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18. In the circuit shown in figure find



a) the rate of conversion of internal (chemical)
energy to electrical energy within the battery
(b) the rate of dissipation of electrical energy
in the battery
(c) the rate of dissipation of electrical energy
in the external resistor.

A. 24W

B. 20W

C. 4W

D. 14W

#### **Answer:**

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19. In the circuit shown in figure find



a) the rate of conversion of internal (chemical)
energy to electrical energy within the battery
(b) the rate of dissipation of electrical energy
in the battery
(c) the rate of dissipation of electrical energy
in the external resistor.

A. 24W

B. 20W

C. 4W

D. 14W

#### **Answer:**

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20. In the circuit shown in figure find



a) the rate of conversion of internal (chemical)
energy to electrical energy within the battery
(b) the rate of dissipation of electrical energy
in the battery
(c) the rate of dissipation of electrical energy
in the external resistor.

A. 4W

B. 20W

C. 14W

D. 24W

#### Answer:



21. Assertion: The resistivity of a semiconductor increases with temperature.Reason: The atoms of a semiconductor vibrate

with larger amplitude at higher temperature therby increasing it resistivity.

A. Statement-1 True, Statement -2 is Ture,

Statement-2 is a Correct explanation fro

Statement -1

B. Statemwnt -1 is True, Statement -2 is

true, Statement is a NOT a correct

explanation for Statement -1

- C. Statement -1 is False, Statement -2 true
- D. Statement -1 is True, Statement -2 False

### Answer:



**22.** Assertion : In a simple battery circuit the point of lowest potential is positive terminal of the battery. Reason : The current flows towards the point

of the higher potential as it flows in such a

circuit from the negative the positive terminal.

A. Statement-1 True, Statement -2 is Ture, Statement-2 is a Correct explanation fro Statement -1 B. Statemwnt -1 is True, Statement -2 is true, Statement is a NOT a correct explanation for Statement -1 C. Statement -1 is False, Statement -2 true

# D. Statement -1 is True, Statement -2 False

#### Answer:



23. Statement-1 : The temperature coefficient of resistance is positive for metals and negative for p-type semiconductor.
Statement-2 : The effective charge carriers in metals are negatively charged whereas in p-type semiconductor, they are positively charged

A. Statement-1 True, Statement -2 is Ture, Statement-2 is a Correct explanation fro

Statement -1
B. Statemwnt -1 is True, Statement -2 is

true, Statement is a NOT a correct

explanation for Statement -1

C. Statement -1 is False, Statement -2 true

D. Statement -1 is True, Statement -2 False

Answer:

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