# PHYSICS MDCAT <br> <br> Current Electricity 

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## TEST\#03 (UNIT \# 9)

Q. $861 \times 10^{9}$ electrons pass through a conductor in $10 \mu \mathrm{~s}$. The current in $(\mu \mathrm{A})$ through the conductor is:
A) 1.6
B) 16
C) 0.16
D) 160
Q. 87 When will 5 C of charge pass a point in an electrical circuit?
A) When 5 A moves through a voltage of 5 V
B) When a power of 5 W is used for 5 s
C) When the current is $\mathbf{2 5} \mathbf{~ m A}$ for 200 s
D) When the current is 10 A for 10 s
Q. 88 Which of the following statement is not true?
A) Charge carriers in electrolytes are ions
B) Charge carriers in gases and plasma are electrons and ions
C) Charge carriers in semiconductors are ions and holes
D) Charge carriers in metals are free electrons


Four resistance $4 \Omega, 6 \Omega, 9 \Omega$ and $11 \Omega$ are connected as shown to a battery of emf of 4 V and negligible internal resistance. Now, the value of $V_{D}-V_{B}$ is:

A) $\mathbf{- 0 . 2 ~ V}$
B) 0.4 V
C) 0.2 V
D) -0.4 V
Q. 90 What is the ammeter reading in the circuit of figure?

Q. 91 A wire has resistance $12 \Omega$. It is bend in form of a square. The effective resistance between any two diagonal vertices of square is:
A) $3 \Omega$
B) $4 \Omega$
C) $12 \Omega$
D) $6 \Omega$
Q. 92 If the current drawn from the battery is " 1 A ", the current in the circuit shown through "R" will be _?

A) 0.25 A
C) 0.75 A
B) 0.50 A
D) 1.0 A

MDCAT TEST \# 03
Q. 93 In the circuit shown, what is the value of $R_{1}$ ?

A) $0.25 \Omega$
B) $0.5 \Omega$
C) $1.5 \Omega$
D) $2.5 \Omega$
Q. 94 Which of the following is the device with variable slope of current voltage graph?
A) Tungsten filament bulb
C) Transistor
B) Semiconductor Diode
D) All of these
Q. 95 Two wires of the same dimensions but resistivity $\rho_{1}$ and $\rho_{2}$ are connected in series. The equivalent resistivity of the combination is:
А) $\frac{\rho_{1}+\rho_{2}}{2}$
C) $\rho_{1}+\rho_{2}$
B) $2\left(\rho_{1}+\rho_{2}\right)$
D) $\sqrt{\rho_{1}+\rho_{2}}$
Q. 96 A wire is stretched such that its radius becomes half of present value. If its initial resistance was ' $2 R$ ', then the resistance now becomes:
A) 32 R
B) 16 R
C) 24 R
D) $4 R$
Q. 97 Two electric bulbs have tungsten filament of same length. If one of them gives 50 watt and other 25 watt, then:
A) 50 watt bulb has thinner filament.
B) $\mathbf{2 5}$ watt bulb has thinner filament.
C) Both filaments are of same thickness
D) None of these
Q. 98 If $R_{1}$ and $R_{2}$ are respectively the filament resistances of a 25 W bulb and 100 W bulb, designed to operate on the same voltage, then:
A) $\mathbf{R}_{1}=4 \mathbf{R}_{2}$
B) $R_{2}=4 R_{1}$
C) $R_{2}=8 R_{1}$
D) $\mathrm{R}_{1}=8 \mathrm{R}_{2}$
Q. 99 Three similar light bulbs are connected to a constant voltage D.C supply as shown in the diagram. Each bulb operates at normal brightness and an ammeter of negligible resistance registers a steady current.


If we add forth identical bulb in parallel with these three bulbs, What happens to the ammeter reading and the brightness of the remaining bulbs?
A) Ammeter reading increases, bulb brightness increases
B) Ammeter reading increases, bulb brightness remains unchanged
C) Ammeter reading remains unchanged, bulb brightness remains unchanged
D) Ammeter reading decreases, bulb brightness remains unchanged
Q. 100 A battery of emf 20 V and internal resistance $r$ is connected across external resistance $R$. What is the observed potential difference across the terminals of the battery when external resistance $R$ is made equal to internal resistance $r$ :
A) 20 V
B) 10 V
C) 15 V
D) 5 V
Q. 101 The potential difference between the terminals of a cell in open circuit is $\mathbf{2 . 2}$ volt. With resistance of $5 \mathbf{~ o h m}$ across the terminals of a cell, the terminal potential difference is $\mathbf{1 . 8}$ volt. The internal resistance of the cell is:
A) $\frac{9}{10} \mathrm{ohm}$
B) $\frac{7}{12} \mathrm{ohm}$
C) $\frac{10}{9} \mathrm{ohm}$
D) $\frac{12}{7} \mathrm{ohm}$
Q. 102 The current flowing through a resistor " $R$ " when connected across a cell of emf " $E$ " and internal resistance " $r$ " is expressed as:
A) $\frac{E-V}{R}$
B) $\frac{E-V}{r}$
C) $\frac{E}{r+R}$
D) $\frac{\mathrm{E}}{R-r}$

Q. 103 In the circuit shown, the rate of energy dissipation in the external resistor is:

A) 2 W
B) 4 W
C) 16 W
D) 8 W
Q. 104 The KVL equation for following circuit is:
Q. 105 "If a source of emf is traversed from negative to positive terminal, the potential change is positive, it is negative in opposite direction", is a statement of:
A) Kirchhoff's current law
C) Kirchhoff's mesh rule
B) Kirchhoff's voltage law
D) Rule for finding potential change
Q. 106 In the circuit diagram shown, the current " $I$ " will be:

A) $24-\mathrm{IR}_{1}+12-\mathrm{IR}_{2}-\mathrm{IR}_{3}=0$
B) $-24+\mathrm{IR}_{1}+12-\mathrm{IR}_{2}+\mathrm{I} \mathrm{R}_{3}=0$
C) $24-\mathrm{IR}_{1}+12-\mathrm{IR}_{2}+\mathrm{IR}_{3}=0$
D) $12-\mathrm{IR}_{1}-\mathrm{IR}_{2}-\mathrm{IR}_{3}=0$

A) 3.4 A
B) 1.7 A
C) 2.3 A
D) 3.7 A
Q. 107 When three identical bulbs of $60 \mathrm{~W}, 200 \mathrm{~V}$ rating are connected in series to a 200 V supply, the power drawn by them will be:
A) 60 W
B) 180 W
C) 10 W
D) $\mathbf{2 0} \mathbf{~ W}$
Q. 108 The resistor of resistance $R$ is connected to 25 V supply, rate of heat produced in it is 25 J $\mathrm{s}^{-1}$. The value of $R$ is:
A) $225 \Omega$
B) $25 \Omega$
C) $50 \Omega$
D) $125 \Omega$

MDCAT TEST \# 03
Q. 109 The length of a wire is doubled. Its conductance will be:
A) Unchanged
C) Doubled
B) Halved
D) Quadrupled
Q. 110 Two 220 V , 100 W bulbs are first connected in series then in parallel. Each time the combination is connected to 220 V supply. The power drawn by the combination in each case respectively will be:
A) $200 \mathrm{~W}, 160 \mathrm{~W}$
B) $50 \mathrm{~W}, 100 \mathrm{~W}$
C) $50 \mathrm{~W}, 200 \mathrm{~W}$
D) $100 \mathrm{~W}, 50 \mathrm{~W}$
Q. 111 Two unequal resistances are connected in parallel across a cell. Which of the following statement is true?
A) Same current is set up in both resistors
C) Current through larger resistor is more
B) Current through smaller resistor is more
D) Any of these
Q. 112 Four equal resistors when connected in series dissipate 5 W power. If they are connected in parallel, the power dissipated will be:
A) 20 W
B) 40 W
C) 60 W
D) 80 W

Q. 113 Current drawn from cell in circuit shown is:

A) 1 A
B) 4 A
C) 5 A
D) 2 A
Q.114 A current of 2.0 A passes through a wire in 1.5 min . The magnitude of charge flowing is:
A) 60 C
B) $\mathbf{1 8 0 ~ C}$
C) 30 C
D) 90 C
Q. 115 Temperature coefficient of resistance $(\alpha)$ is equal to:
A) $\frac{R_{t}+R_{o}}{R_{o} \Delta t}$
C) $\frac{\left(R_{o}-R_{t}\right)}{R_{o} \Delta t}$
В) $\frac{R_{t}-R_{o}}{R_{o} \Delta t}$
D) None of these

