

**BASIC ELECTRICAL ITI/DIPLOMA BASED MOSTLY ASKED  
140 QUESTIONS & ANSWER**

**1.** A terminal where more than two branches meet is called

- a) Node
- b) Terminus
- c) Loop
- d) None of the above

Ans-A

**2.** An ideal current source has

- a) Infinite source resistance
- b) Zero internal resistance
- c) Zero voltage on no load
- d) Zero ripple

Ans-A

**3.** An ideal voltage source should have

- a) Zero source resistance
- b) Infinite source resistance
- c) Terminal voltage is proportional to current
- d) Open-circuit voltage nearly equal to voltage of the load current

Ans-A

**4.** Mesh analysis is based on

- a) Kirchhoff's Current Law
- b) Kirchhoff's Voltage Law
- c) Both
- d) None

Ans-B

**5.** In a four branch parallel circuit, 10mA of current flows in each branch. If one of the branches opens, what is the current in each of the other branches

- (a) unaffected
- (b) increases
- (c) decreases
- (d) doubles

Ans-B

**6.** Identify the passive element among the following

- a. Voltage source
- b. current source
- c. inductor
- d. transistor

Ans-C

7. How much energy is stored by a  $0.05\mu\text{F}$  capacitor with a voltage of  $1000\text{V}$ ?

a.  $0.025\text{J}$

b.  $0.05\text{J}$

c.  $5\text{J}$

d.  $100\text{J}$

Ans-A

8. The unit of power is .....

a. Watts

b. Volts

c. Current

d. None

Ans-A

9. The nodal method of circuit analysis is based on .....

a. KVL + ohms law

b. KCL + ohms law

c. KVL + KCL

d. KVL + ohms law + KCL

Ans-A

10. In a four branch series circuit,  $10\text{mA}$  of current flows in each branch. If one of the branch opens, what is the current in each of the other branches

(a) unaffected

(b) increases

(c) decreases

(d) zero

Ans-D

11. State Kirchoff's current Law.

(a) sum of all positive currents is equal to sum of all negative currents.

(b) sum of all positive emfs is equal to the sum of all negative emfs taken in order

(c) sum of all powers in a circuit

(d) sum of all emfs in a circuit

Ans-A

**12. Define Kirchoff's voltage law**

- (a) algebraic sum of emf's - algebraic sum of voltage drops = 0
- (b) algebraic sum of emf's + algebraic sum of voltage drops = 0
- (c) zero
- (d) algebraic sum of currents

Ans-A

**13. Ohm's Law states that current through a conductor, under -----conditions is proportional to potential difference across the conductor.**

- (a) constant pressure
- (b) constant pressure, temperature and volume
- (c) constant volume
- (d) constant temperature

Ans-B

**14. Find the voltage between A and B, for the figure 1 shown below**

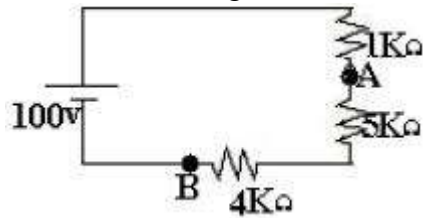


figure 1

- (a) 100V
- (b) 900V
- (c) 90V
- (d) 10V

Ans-C

**15. In a parallel circuit, the relation between different currents is**

- (a)  $I_T = I_1 + I_2 + I_3 + I_4 + \dots$
- (b)  $I_T = I_1 \times I_2 \times I_3 \dots$
- (c)  $I_1 + I_2 + I_3 + \dots = \text{infinity}$
- (d)  $I_T = I_1 + I_2 + I_3 + \dots$

Ans-D

**16. What are the units of voltage, current and Resistance respectively?**

- (a) Ohms, Volts, Amperes
- (b) Volts, Farads, Amperes
- (c) Henries, Volts, Amperes
- (d) Volts, Amperes, Ohms

Ans-D

**17. The following voltage drops are measured across each of three resistors in series: 5.2V, 8.5V, 12.3V. What is the value of the source voltage to which these resistors are connected?**

- (a) 26V
- (b) 5.2V
- (c) 8.2V
- (d) 12.3V

Ans-A

**18. In the figure 2 shown below find the current in the resistor R1**

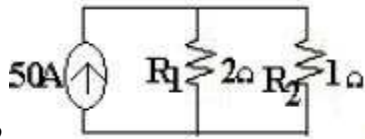


figure 2

- (a) 15V
- (b) 15A
- (c) 16.6A
- (d) 16.6V

Ans-C

**19.** The unit of energy is

- a. Watts
- b. Volts
- c. Current
- d. None

Ans-D

**20.** What is the rule followed for kirchoff's voltage law?

- (a) mesh rule
- (b) current rule
- (c) loop rule
- (d) wheat stone rule

Ans-A

**21.** In a parallel circuit, the total resistance of circuit-----as the number of resistors connected in parallel-----

- (a) increases, increases
- (b) increases, decreases
- (c) decreases, decreases
- (d) decreases, increases

Ans-D

**22.** A battery of emf 12V is connected to an external resistance of 20 ohm. Find current flowing through resistor

- (a) 4
- (b) 0.6
- (c) 40
- (d) None

Ans-B

**23.** In a series circuit, the total resistance of circuit-----as the number of resistors connected in series -----

- (a) increases, increases
- (b) increases, decreases
- (c) decreases, decreases
- (d) decreases, increases

Ans-A

**24.** An ammeter is used to measure the flow of----- in a circuit

- (a) Energy
- (b) Power
- (c) Current
- (d) Voltage

Ans-A

**25.** In the figure 3 shown, equivalent resistance is

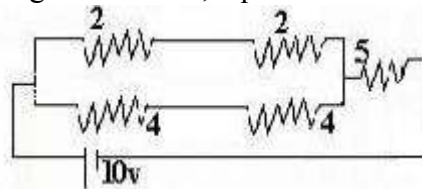


figure 3

- (a) 1.512 ohms
- (b) 7.667ohms
- (c) 7.777ohms
- (d) None

Ans-B

**26.** What is the relationship between the resistance and voltage when the current is kept constant?

- (a) equal to
- (b) inversely proportional
- (c) directly proportional
- (d) constant

Ans-D

**27.** Sign convention used for potential is:

- (a) rise in potential is positive
- (b) rise in potential is zero
- (c) Rise in potential is negative
- (d) rise in potential is equal to fall in potential

Ans-A

**28.** In a four branch series circuit, 100mA of current flows in each branch. If one of the branch opens, what is the current in each of the other branches

- (a) increases
- (b) unaffected
- (c) doubles
- (d) zero

Ans-D

**29.** Ten cells, each of emf 1.5V are connected in series. What current will they send through an external resistance of 4 ohm

- (a) 6.0 A
- (b) 2.5 A

- (c) 3.75 A
- (d) None

Ans-

30. A battery of emf 1.8 volts is connected to a pair of resistances 4 ohm and 6 ohm in parallel. Calculate the current supplied by the battery

- (a) 7.5 A
- (b) 10 A
- (c) 1.75 A
- (d) 0.75 A

Ans-D

31. When  $n$  resistances of value  $x$  are connected in series, total resistance is

- (A)  $nx$  (B)  $nx$  (C)  $x/n$  (D)  $n^2 x$ .

Ans-A

32. Which of the following is not the same as watt?

- (A) joule/sec (B) amperes/volt (C) amperes  $\times$  volts (D) ( amperes )<sup>2</sup>  $\times$  ohm.

Ans-B

33. A circuit contains two un-equal resistances in parallel

- (A) current is same in both (B) large current flows in larger resistor
- (C) potential difference across each is same (D) smaller resistance has smaller conductance.

Ans-C

34. Four identical resistors are first connected in parallel and then in series. The resultant resistance of the first combination to the second will be

- (A) 1 / 16 times (B) 1 / 4 times (C) 4 times (D) 16 times.

Ans-A

35. The ratio of the resistance of a 100 W, 220 V lamp to that of a 100 W, 110 V lamp will be nearly

- (A) 4 (B) 2 (C) 1 / 2 (D) 1 / 4

Ans-A

36. Three 3 ohm resistors are connected to form a triangle. What is the resistance between any two of the corners?

- (A) 3 / 4 ohms (B) 3 ohms (C) 2 ohms (D) 4/3 ohm.

Ans-C

37. A wire of 0.14 mm diameter and specific resistance 9.6 micro ohm-cm is 440 cm long. The resistance of the wire will be

- (A) 9.6 ohm (B) 11.3 ohm (C) 13.7 ohm (D) 27.4 ohm.

Ans-D

38. Ohm's law is not applicable to

- (A) DC circuits (B) high currents (C) small resistors (D) semi-conductors.

Ans-D

39. A wire of resistance  $R$  has its length and cross-section both doubled. Its resistance will become

- (A)  $4R$  (B)  $2R$  (C)  $R$  (D)  $R/4$ .

Ans-C

40. Ohm's law is not applicable in all the following cases Except

- (A) Electrolytes (B) Arc lamps (C) Insulators (D) Vacuum ratio values.

Ans-C

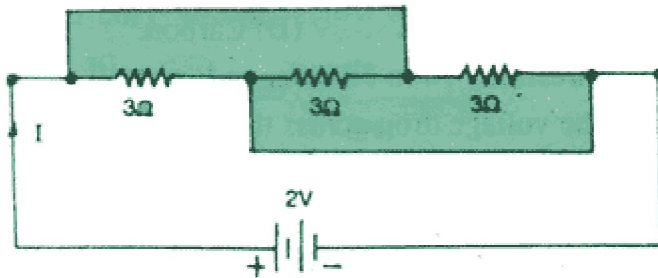
41. Three elements having conductance  $G_1$ ,  $G_2$  and  $G_3$  are connected in parallel. Their combined conductance will be

- (A)  $1/(1/G_1 + 1/G_2 + 1/G_3)$  (B)  $(G_1G_2 + G_2G_3 + G_3G_1)/(G_1 + G_2 + G_3)$

- (C)  $1/(G_1 + G_2 + G_3)$  (D)  $G_1 + G_2 + G_3$

Ans-D

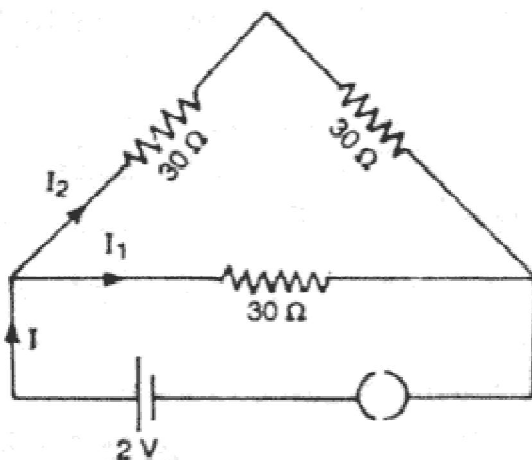
42. For the circuit shown below the current  $I$  flowing through the circuit will be



- (A)  $1/2$  A (B) 1 A (C) 2 A (D) 4 A.

Ans-C

43. In the circuit shown below, the current  $I$  is



(A)  $1/45$  A (B)  $1/15$  A (C)  $1/10$  A (D)  $1/5$  A.

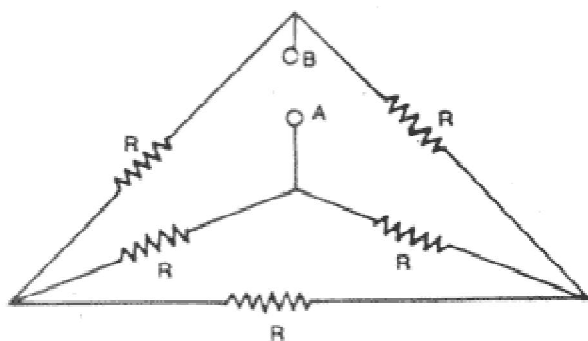
Ans-C

44. All good conductors have high

- (A) resistance (B) electrical conductivity  
(C) electrical and thermal conductivity (D) conductance.

Ans-D

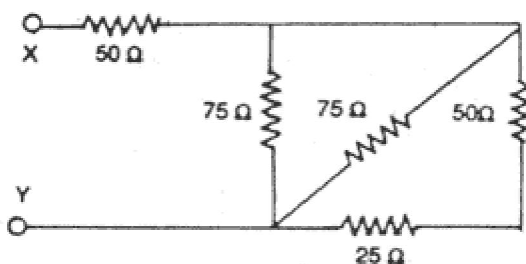
45. Resistance across A and B in the circuit shown below is



(A)  $R$  (B)  $3R$  (C)  $4R$  (D)  $5R$ .

Ans-A

46. Equivalent Resistance between X and Y is



(A) 50 ohm (B) 75 ohm (C) 275 ohm (D) none of the above.

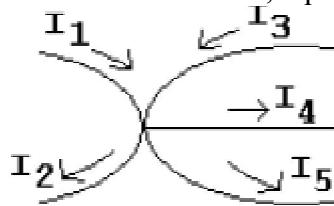
Ans-D

**Fill in the Blanks. \_\_\_\_\_ANS**

1. Give examples for active elements----- (voltage and current sources)
2. The relation between voltage and current in a capacitor is \_\_\_\_\_ ( $v = (1/C) \int i \cdot dt$ )
3. Energy stored in a capacitor is given as ----- ( $(1/2)Cv^2$ )
4. The relation between voltage and current in an inductor is \_\_\_\_\_ ( $v = L(di/dt)$ )
5. The opposition offered by capacitor to rate of change of voltage across it is called -----  
(capacitance)
6. The basis for nodal analysis is \_\_\_\_\_ law (KCL)
7. Ohm's Law is given by \_\_\_\_\_ ( $I = V/R$ )
8. Give examples for passive elements ----- (R, L & C)

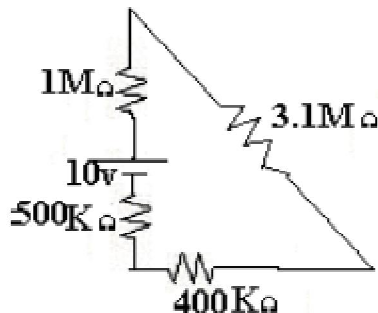


9. Energy stored in a inductor is given as-----  $((1/2)LI^2)$
10. The relation between voltage and current in a resistor is \_\_\_\_\_  $(V=IR)$
11. The opposition offered by inductor to rate of change of current through it is called -----  
(inductance)
12. The basis for mesh analysis is \_\_\_\_\_ law (KVL)
13. The flow of electrons is called as ..... (electric current)
14. The equivalent resistance of resistors  $R_1$ ,  $R_2$  &  $R_3$  in parallel is -----  
 $(1/((1/R_1)+(1/R_2)+(1/R_3)))$
15. ----- materials are examples for conductors (Copper & Aluminum)
16. The opposition offered by resistor to flow of electrons is called----- (Resistance)
17. The algebraic sum of currents flowing towards a junction in an electric circuit is equal to----  
----- (algebraic sum of currents leaving that junction)
18. In a series circuit total ----- is equal to sum of powers of each resistor in series.  
(power)
19. -----Force will be there between oppositely charged bodies (attractive)
20. -----Force will be there between positively charged bodies (repulsive)
21. A conductor have -----number of free electrons than semi conductor. (more)
22. In the circuit 1 shown below, equation according to KCL is-----  $(I_1+I_3=I_2+I_4+I_5)$



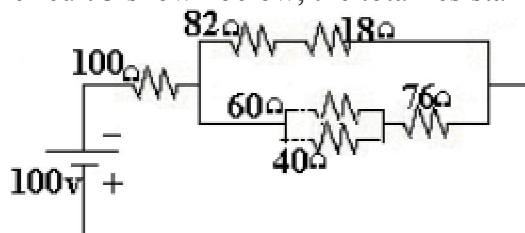
Circuit1

23. ----- materials are examples for semi conductors (Germanium & Silicon)
24. ----- materials are examples for insulators (Paper & Mica)
25. ----- is the current in the circuit 2 shown below? ( $2\mu A$ )



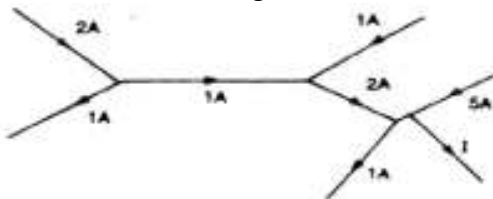
circuit 2

26. For the circuit 3 shown below, the total resistance is ----- (150 Ohm)

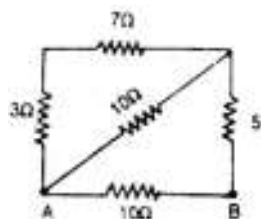


circuit 3

27. The unit of power is ----- (Watts)
28. The unit of charge is ----- (Coulomb)
29. The equivalent resistance of two resistors  $R_1$  &  $R_2$  in parallel is ----- ( $1/((1/R_1)+(1/R_2))$ )
30. The energy dissipated in Resistor is given by ----- ( $i^2 R t$  Joules)
31. Define KVL----- (algebraic sum of voltages around any closed path in an electric circuit is equal to zero)
32. Define KCL----- (algebraic sum of currents flowing towards a junction in an electric circuit is equal to algebraic sum of currents leaving that junction)
33. Current in a capacitor is given by----- ( $i=C(dv/dt)$ )
34. Current in an inductor is given by----- ( $i=(1/L)\int v.dt$ )
35. Current in a resistor is given by----- ( $I=V/R$ )
36. Resistivity of a wire depends on\_\_\_\_\_. (material)
37. Resistance of a wire is  $r$  ohms. The wire is stretched to double its length, then its resistance in ohms is\_\_\_\_\_. ( $4r$ )
38. Kirchhoff's second law is based on law of conservation of\_\_\_\_\_. (energy)
39. The charge on an electron is known to be  $1.6 \times 10^{-19}$  coulomb. In a circuit the current flowing is 1 A. How many electrons will be flowing through the circuit in a second\_\_\_\_\_ ( $0.625 \times 10^{19}$ )
40. Ampere second could be the unit of\_\_\_\_\_. (charge)
41. One kilowatt hour of electrical energy is the same as\_\_\_\_\_ Joules. ( $36 \times 10^5$  joules)
42. An electric current of 5 A is same as\_\_\_\_\_ C/Sec. (5)
43. The value of the following is given by 100 (kilo ampere ) x ( micro ampere )x 100 milli ampere \* 10 ampere is\_\_\_\_\_ A. ( 0.1 A )
44. A circuit contains two un-equal resistances in parallel The Potential across them\_\_\_\_\_. (same)
45. Conductance is expressed in terms of\_\_\_\_\_. (mho)
46. Two resistances  $R_1$  and  $R_2$  give combined resistance of 4.5 ohms when in series and 1 ohm when in parallel. The resistances are\_\_\_\_\_. (1.5ohms and 3ohms)
47. We have three resistances of values  $2\ \Omega$ ,  $3\ \Omega$  and  $6\ \Omega$ . Which of the following combination will give an effective resistance of  $4\ \Omega$ . The Resistors are connected in\_\_\_\_\_.  
(  $2\ \Omega$  resistance in series with parallel combination of  $3\ \Omega$  and  $6\ \Omega$  resistance)
48. Current  $I$  in the figure is\_\_\_\_\_. (6A)



49. The unit of electrical conductivity is\_\_\_\_\_. (mho / metre )
50. The resistance of a 100 W, 200 V lamp is\_\_\_\_\_. (400 ohm)
51. Five resistances are connected as shown in figure below. The equivalent resistance between the points A and B will be\_\_\_\_\_. (5 ohms)



52. How many different combinations may be obtained with three resistors, each having the resistance  $R$  \_\_\_\_\_.(4)

53. Ohm's law is applicable to \_\_\_\_\_.(DC Circuits only)

54. A resistance of 5 ohms is further drawn so that its length becomes double. Its resistance will now be \_\_\_\_\_.(20 ohms)

55. Specific resistance of a substance is measured in \_\_\_\_\_.(ohm-cm)

56. Resistivity is usually expressed in terms of \_\_\_\_\_.( ohms/cm-cube)

57. Inductor opposes sudden change in \_\_\_\_\_.(Current)

58. Capacitor opposes sudden change in \_\_\_\_\_.(Voltage)

59. 2F and 4F are connected in series. What is resultant value \_\_\_\_\_.(1.33F)

60. 3H and 6H are connected in parallel. What resultant value \_\_\_\_\_.(2H)

61. What is Voltage value in KCL \_\_\_\_\_.(Constant)

62. Units of potential is \_\_\_\_\_.(Volts)

63. What is current flowing through the open circuit \_\_\_\_\_.(Zero)

## TRUE/FALSE QUESTIONS

## Answer

- 1) Sign convention used for potential is rise in potential is positive is ----- (T/F) T
- 2) An ammeter is used to measure the flow of voltage in a circuit is----- (T/F) F
- 3) A battery has an emf of 12.9 volts and supplies a current of 3.5 A. The resistance of the circuit is 3.69 A is ----- (T/F) T
- 4) If one of the resistors in parallel circuit is removed, then the total resistance remains Constant is ----- (T/F) F
- 5) In the Figure 1 the current direction is

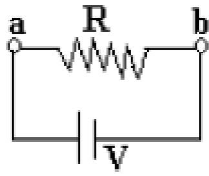


Figure 1

- from b to a is ----- (T/F) F
- 6) In the Figure 1 the according to Kirchhoff's Voltage Law  $V = IR$  is ----- (T/F) F
- 7) The Voltmeter is used to measure the current in a circuit is ----- (T/F) F
- 8) In any closed circuit, the algebraic sum of all the electromotive forces and the voltage drops is equal to zero is ----- (T/F) T
- 9) For a parallel circuit  $I_1 + I_2 + I_3 = 0$  is ----- (T/F) T
- 10) An ammeter is connected in series with the load ----- (T/F) T
- 11) In a series circuit, the total power = sum of powers of each resistor in series---(T/F) T
- 12) A voltmeter is connected in series with the load ----- (T/F) F
- 13) Kirchhoff's current Law is stated as sum of all powers in a circuit ----- (T/F) F
- 14) For a parallel circuit,  $V_T = V_1 + V_2 + \dots + V_m$  ----- (T/F) F
- 15) One cycle of 360degrees is corresponds to  $2\pi$  radians----- (T/F) T
- 16) The voltage between A and B, for the Figure 2 shown below is 0 Volts is----- (T/F) F

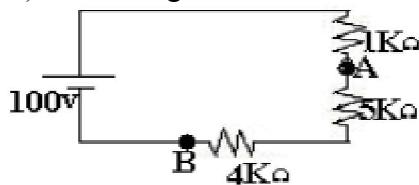


Figure 2

- 17) Kirchhoff's voltage law is written as  $E - V_1 - V_2 = 0$  ----- (T/F) T
- 18) In the Figure 3 shown below the current in the resistor  $R_1 = 3$  is ----- (T/F) F

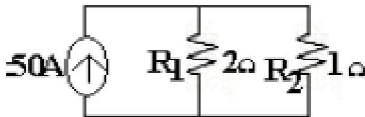


Figure 3

- 19) A terminal where more than two branches met is called Node is ----- (T/F) T
- 20) In the circuit 1 given below,  $V_1 = 7.5V$ ;  $V_2 = 12.5V$  then  $E=0$  is ----- (T/F) F

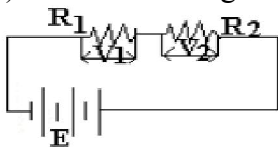


Figure 2

- 21) An ideal current source has Zero internal capacitance is ----- (T/F) F
- 22) An ideal voltage source should have Zero source resistance----- (T/F) T
- 23) Mesh analysis is based on Kirchhoff's Current Law ----- (T/F) F
- 24) An ideal voltage source is passive element is ----- (T/F) F
- 25) A current source is active element is ----- (T/F) T
- 26) The energy stored by a  $0.05\mu H$  inductor with a voltage of 1000V is 0.025J----- (T/F) T
- 27) The nodal method of circuit analysis is based on KCL + ohms law is ----- (T/F) T

- |                                     |       |       |   |
|-------------------------------------|-------|-------|---|
| 28) Volts is the unit of Resistance | ----- | (T/F) | F |
| 29) Farads is the unit of inductor  | ----- | (T/F) | F |
| 30) Amperes is the unit of voltage  | ----- | (T/F) | F |