1) The figure below shows currents in a part of the electric circuit. The current i is:


2 A   1 A

2 A   1.3 A
i
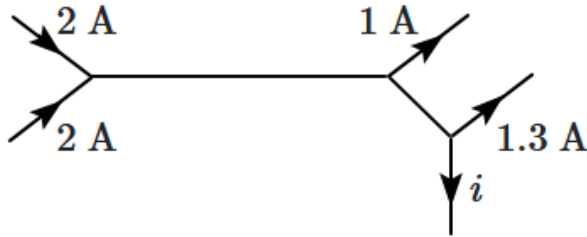
   a) 1.7 A
   b) 3.7A
   c) 1.3 A
   d) 1A

2) In an experiment Alpha rays are projected, if number of alpha rays emitted per second are 6.25×10^{15} then the current being generated because of these particles is:
   a) 1 mA
   b) 2 mA
   c) 3 mA
   d) 4 mA

3) Temperature coefficient of silver is 3.8×10^{-3} /°C, what is the resistivity at 330°C, if resistivity at 30° C is 1.59×10^{-8} ohm-m
   a) 3.4×10^{-8} ohm-m
   b) 2.3×10^{-8} ohm-m
   c) 4.8×10^{-8} ohm-m
   d) 5.6×10^{-8} ohm-m

4) In the given circuit, the current in resistance R, is:

R_2
4Ω
R_1 1Ω
2Ω 4Ω R_4
R_3
10V
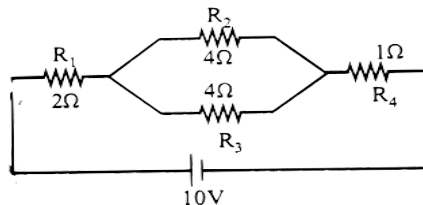
   a) 2.5A
   b) 1A
   c) 1.5 A
   d) 2A

5) What's the resistance of a hollow cylinder of length 2m with outer radius as 10cm and in a radius 5cm, and 2×10^6 /ohm/m is the conductivity of the cylinder?
   a) 53.3 Mega ohm
   b) 6.39 kilo ohm

c) 63.9 mega ohm

d) 0.42 milli ohm

6) Number of electrons flowing per second in a conductor which has resistance of 2 ohms, connected across the battery of potential difference 6.4 Vis:

    a) 2×10^{19}

    b) 3×10^{19}

    c) 4×10^{19}

    d) 5×10^{19}

7) If the resistance of a wire is 15 ohms, the wire is cut into two parts. It is cut in such a way that one part is one third of the whole wire. What is the resultant resistance of the combination if they both are connected in parallel?

    a) 5 ohm

    b) 15 ohm

    c) 10/3 ohm

    d) 3/10 ohm

8) The current flowing through R_2 is:


    a) ⅔ A

    b) ¼ A

    c) ½ A
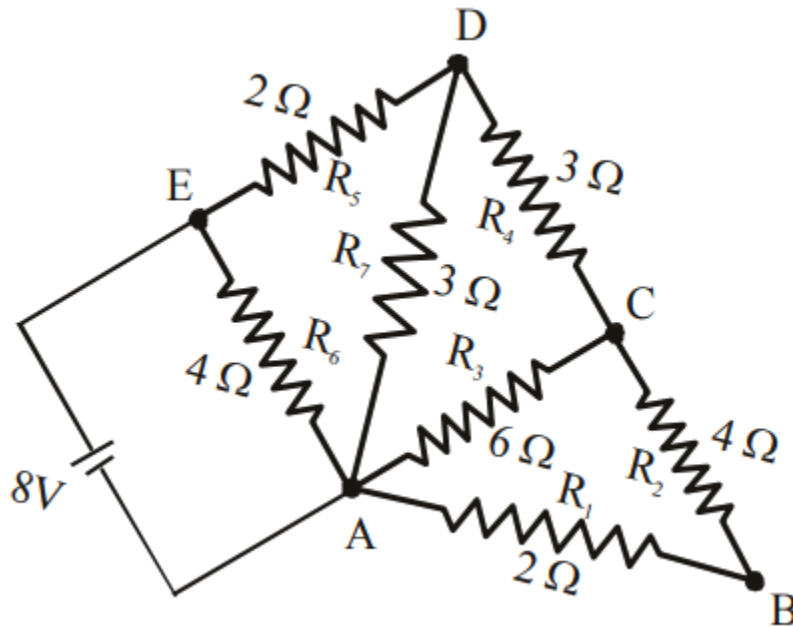
    d) ⅓ A

9) A uniform metallic wire has resistance of 18 ohm is bent into an equilateral triangle. Then the resistance between any two vertices of the triangle is:

    a) 4 ohm

    b) 8 ohm

    c) 12 ohm

    d) 2 ohm

10) If k_1 = 5.6 x 10^{-3} ohm^{-1} m^{-1}, is the conductivity of a material temperature 50° Celsius, and k_2 is the conductivity of the material at 100° Celsius, if the temperature coefficient of resistivity is 1.2 x 10^{-3}/° C, find k_2
    a) 5.29 x 10^{-3} ohm^{-1} m^{-1}
    b) 5.9 x 10^{-3} ohm^{-1} m^{-1}
    c) 5.4 x 10^{-3} ohm^{-1} m^{-1}
    d) 6 x 10^{-3} ohm^{-1} m^{-1}
11) If two identical wires of the same materials are taken. If one of the wires is stretched to double its length, and another wire is stretched so that the area of the cross section gets half of original. What is the ratio of resistances of first wire to second wire?
    a) 1:2
    b) 2:1
    c) 4:1
    d) 1:1
12) Drift velocity of current in a wire of cross section area 2 x 10^{-6} m^2, with number density of free electrons is 8 x 10^{28} m^{-3} is: (if current passing through the wire is 2 A)
    a) 7.8 x 10^{-4} m/s
    b) 8.8 x 10^{-4} m/s
    c) 6.8 x 10^{-4} m/s
    d) 5.8 x 10^{-4} m/s
13) Find the ratio of resultant resistance when S1 and S2 are open to closed cases
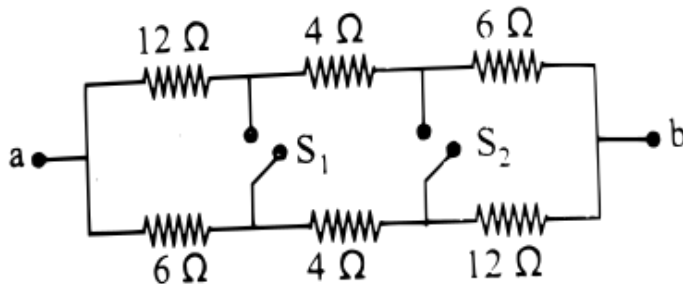

    a) 1:1
    b) 12:6
    c) 10:11
    d) 11:12
14) Assertion: equivalent resistance of resistors in a series combination is greater than the equivalent resistance of The parallel combination of same resistors. Reason: the resistivity of a material is independent of temperature
    a) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).
    b) Both Assertion (A) and Reason (R) are the true but Reason (R) is not a correct explanation of Assertion (A).
    c) Assertion (A) is true and Reason (R) is false.
    d) Assertion (A) is false and Reason (R) is true.

15) Rectangular parallel pipe is measured as 1 cm x 1 cm x 100 cm. If specific resistance is 3×10^{-7} ohm-m, then the resistance between its two opposite a rectangular faces will be:
    a) 2 milli ohm
    b) 3 milli ohm
    c) 4 milli ohm
    d) 2.4 milli ohm

16) What is the specific resistance of a material if the wire made of the material is of 2 kilo ohms resistance and its length is 100 cm and cross sectional area is 2 sq mm
    a) 4×10^{-2} ohm
    b) 4×10^{-3} ohm
    c) 2 ohm
    d) 2×10^{-1} ohm

17) A wire of resistance R is bent to form a square ABCD as shown in the figure. The effective resistance between E and C is: (E is midpoint of arm CD)

A   B

D E   C
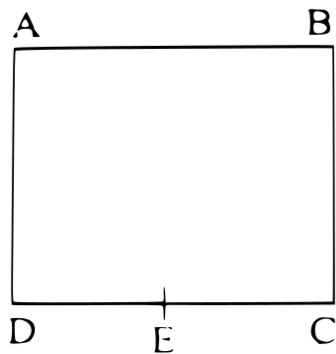
    a) R
    b) 7R/64
    c) 3R/4
    d) R/16

18) If a wire has linear electron density 2.6×10^{10} per meter, it is recorded to have a current of 2mA. What is the drift velocity?
    a) 1.6×10^{5} m/s
    b) 4.8×10^{5} m/s
    c) 3.2×10^{5} m/s
    d) 0.6×10^{5} m/s

19) Find the potential drop across the resistor, if the length of the wire is 100 cm and cross section area is 1 mm^2 has current density of 50000A/m^2, (specific resistance of substance is 5.6×10^{-4} ohm-m)
    a) 2.8 milli volts
    b) 28 milli volts
    c) 2.8 micro volts
    d) 2.8 kilo volts

20) In the given figure $R_1 = 10\ \Omega$, $R_2 = 8\ \Omega$, $R_3 = 4\ \Omega$ and $R_4 = 8\ \Omega$. Battery is ideal with emf 12V. Equivalent resistance of the circuit and current supplied by

battery are respectively.
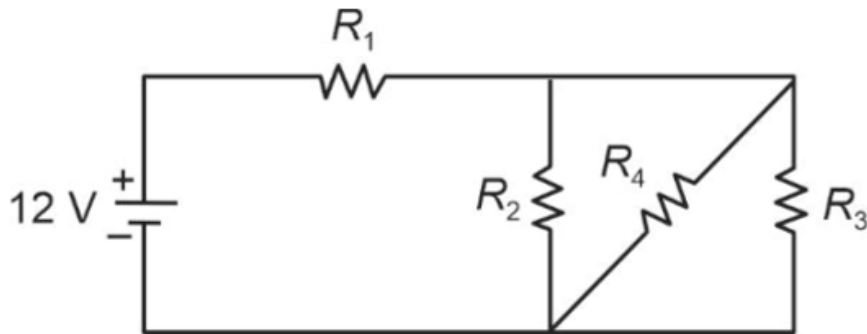
a) 12 ohm and 11.4 A
b) 10.5 ohm and 1.14 A
c) 10.5 ohm and 1 A
d) 12 ohm and 1 A

21) Iron rod length 2 m with the area of Cross section 2 cm^2 is cut into two equal parts and welded side by side all over the one meter length. What will be the resultant resistance of specific resistance is 10^{-7} ohm - m.

a) 4 mA
b) 1mA
c) 2mA
d) 3mA

22) If change in resistance of a conductor is 2k ohm because of increase of temperature from 20 K to 120K, if initial resistance is 25k ohm, then temperature coefficient of resistance is:

a) 8 x 10^{-3}/K
b) 0.2 /K
c) 0.16/K
d) 0.89/K

23) The effective resistance between A and B, if resistance of each resistor is R, will
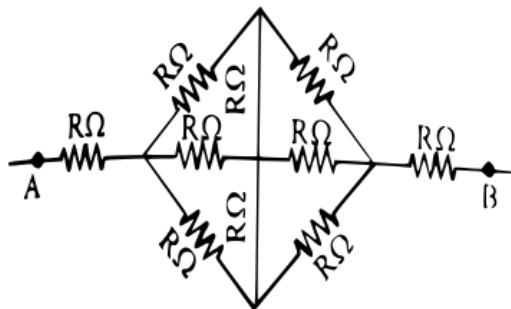
be

a) 2R/3
b) 8R/3
c) 5R/3

d) 4R/3

24) Which of the following is false:
   a) If temperature changes current flowing in the conductor decreases even for the same emf
   b) Emf is a measure of the energy provided per unit charge.
   c) The emf is defined as the potential difference across a source when no current is flowing
   d) It is dependent on the external circuit resistance but independent on the source's internal resistance.

25) Assertion: Current across a resistor increases with the decrease of source resistance
   Reasonn: Emf of the battery decreases because of the internal resistance of the battery
   a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
   b) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).
   c) Assertion (A) is true and Reason (R) is false.
   d) Assertion (A) is false and Reason (R) is true.

26) In the given circuit diagram, a wire is joining points B and D. The current in this wire is:
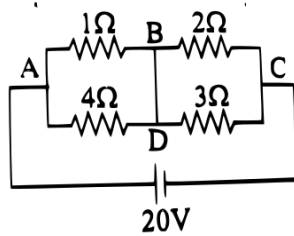
   a) 0.4A
   b) 2A
   c) 4A
   d) 0A

27) The equivalent resistance of the given circuit between the terminals A and B is:

   a) 0 Ω

b) 3 Ω

c) 4.5 Ω

d) 1Ω
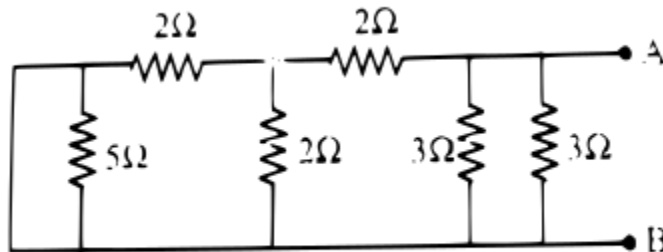
28) 0.9 volt potential difference is maintained across a 1.5 m length of tungsten wire that cross sectional area of 0.6 mm². What is the current in the wire, if the resistivity of tungsten is 5.6 x 10⁻⁸ ohm-m?
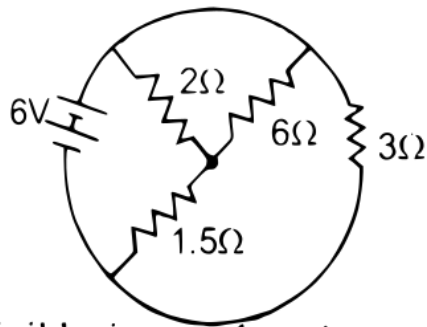
a) 6.4 micro ampere

b) 1.2 micro ampere

c) 6.4 ampere

d) 1.2 ampere

29) The equivalent resistance between A and B is:

a) ⅔ ohm

b) ½ ohm
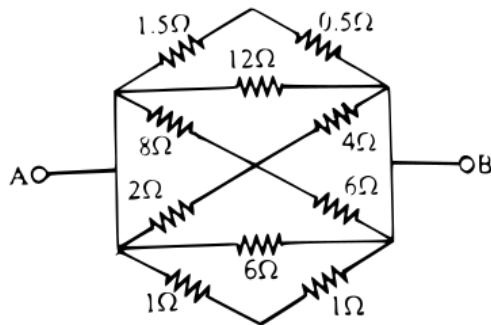
c) 3/2 ohm

d) ⅓ ohm

30) The total current supplied to the circuit by the battery is in amperes:

a) 4

b) 2

c) 1

d) 6

31) The current I_1 (in A) flowing through 1 Ω resistor in the following circuit is:
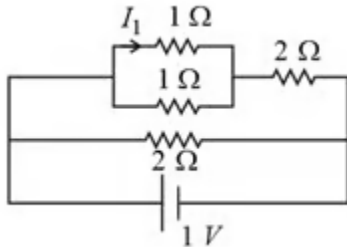
a) 0.4

b) 0.5

c) 0.2

d) 0.25

32) If the current carried by a conductor is doubled what happens to a) current density a) electron drift velocity c) average time between two collisions

   a) Double, double, double

   b) Double, double, remains same

   c) Double, remains same, double

   d) Remains same, double, double

33) The equivalent resistance between points a and b of a network shown in the figure is:
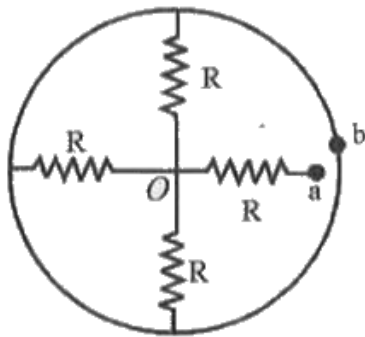
a) 3/4R

b) 4/3R

c) 5/4R

d) 4/5R

34) The order of current density at points A, B and C if the resistor is connected across a potential difference
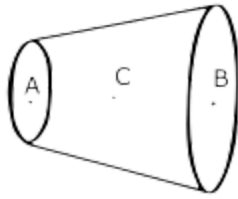
a) A > B > C
b) B > A > C
c) B > C > A
d) A = B > C

35) Which of the following is the correct order of drift velocity at points A,B,C and D:
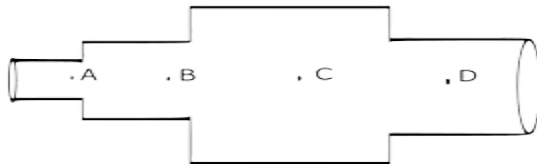
a) A>B>C>D
b) A>B>D>C
c) C>D>B>A
d) None of the above

36) Assertion: If angle made by wires of two incoming currents of 3A and 4 A at a junction is 90°, then current going out of the junction is 5 A.

Reason: electric field which is generated with the potential differences helps to move the current is a vector quantity.

a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
b) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).
c) Assertion (A) is true and Reason (R) is false.
d) Assertion (A) is false and Reason (R) is true.

37)find the resultant resistance of the circuit given below
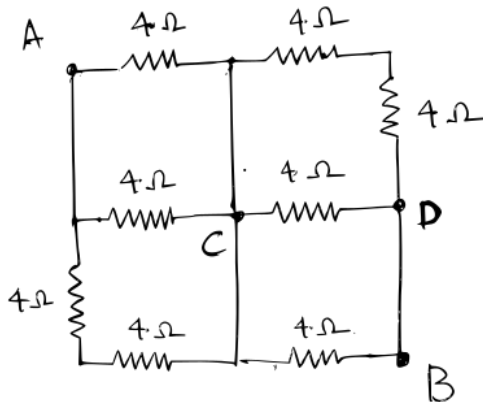
a) 1. 0.8 ohm
b) 2. 1.6 ohm
c) 3. 3.2 ohm
d) 4. 4.8 ohm

38)When the switch S, in the circuit shown, is closed then the valued of current i will
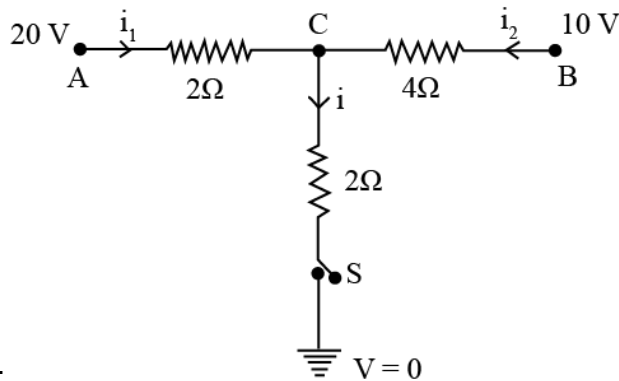
be:

a) 2A
b) 3A
c) 4A
d) 5A

39)Three resistances $2\Omega, 3\Omega$ and 4Ω are connected in parallel. The ratio of currents passing through them when a potential difference is applied across its ends will be
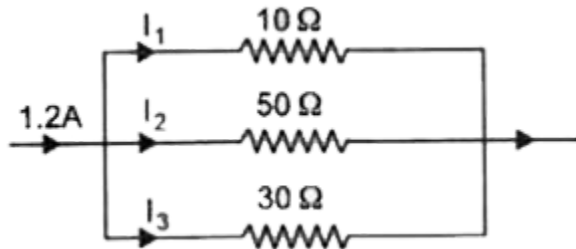
a) 6:4:3
b) 4:3:2
c) 6:3:2
d) 5:4:3

40) If the ammeter in the given circuit reads 2 A, the resistance R is

6 V

a) 1 Ω
b) 2 Ω
c) 3 Ω
d) 4 Ω
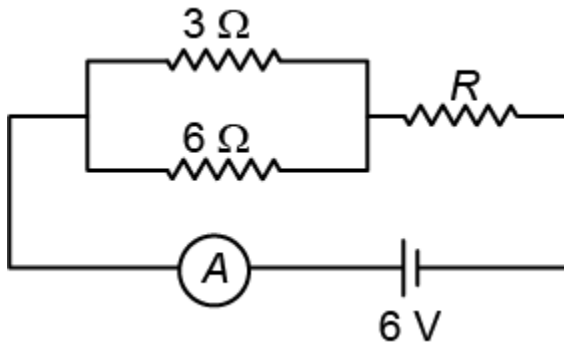
41) In this circuit, the value of I_2 is
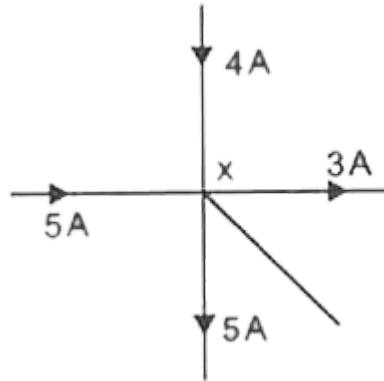

a) 0.2 A
b) 0.3 A
c) 0.4 A
d) 0.6 A

42) The drift velocity does not depend upon:
   a) Cross-section of the wire
   b) Length of the wire
   c) Number of free electrons
   d) Magnitude of the current

43) Five conductors are meeting at a point x as shown in the figure. What is the

value of current in fifth conductor
   a) 3 A away from x
   b) 1 A away from x
   c) 4 A away from x
   d) 1 A towards x

44) Three identical resistances A, B and C are connected as shown in fig
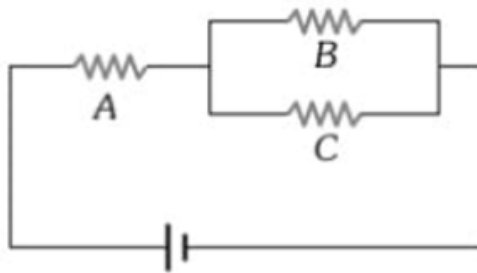
   a) In B
   b) In A
   c) In B and C
   d) Same for A,B and C

45) Emf is most closely related to
   a) Mechanical force
   b) Potential difference
   c) Electric field
   d) Magnetic field

46) The figure shows a network of currents. The magnitude of currents is shown
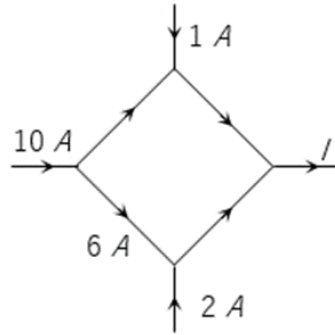
here. The current I will be
- a) 3 A
- b) 9 A
- c) 13 A
- d) 19 A

47) A strip of copper and another of germanium are cooled from room temperature to 80 K. The resistance of
- a) Each of these increases
- b) Each of these decreases
- c) Copper strip increases and that of germanium decreases
- d) Copper strip decreases and that of germanium increases

48) For a metallic wire, the ratio V/i (V the applied potential difference, 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 temperature rises, depending upon the metal

49) The potential difference between A and B in the following figure is
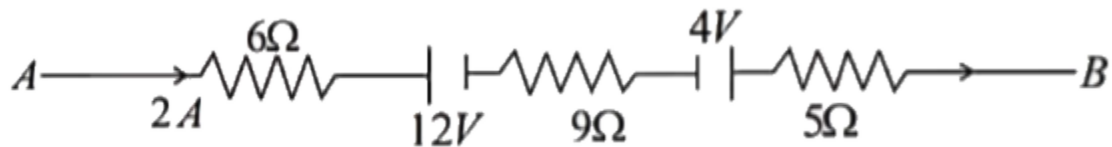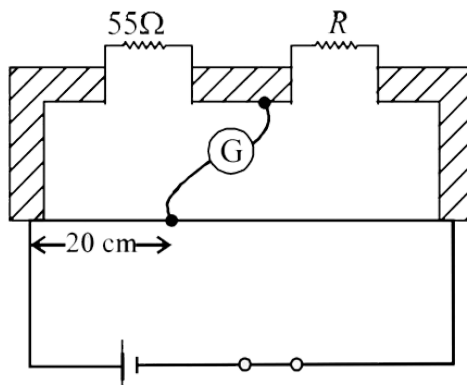

- a) 24 V
- b) 14 V
- c) 32 V
- d) 48 V

50) In the following circuit, Find the heat energy generated in joules in 5 secs on 2
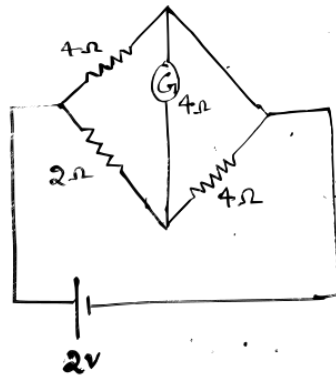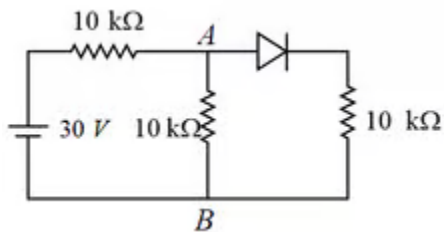

ohm resistor
   a) 5
   b) 0
   c) 10
   d) 20

51) Shown in the figure below is a meter-bridge set up with null deflection in the galvanometer. The value of the unknown resistor R is

   a) 13.75 Ω
   b) 220 Ω
   c) 110 Ω
   d) 55 Ω

52) In the given figure, potential difference between A and B is:

   a) 10 V
   b) 5 V
   c) 15 V

d) 0V

53) To draw maximum current from a combination of cells, how should the cells be grouped:
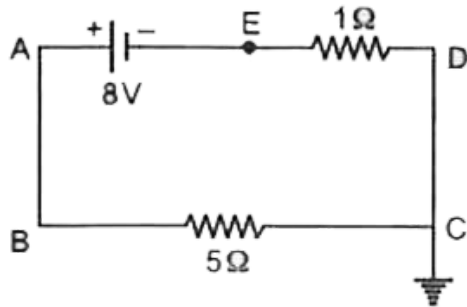   a) Series
   b) Parallel
   c) Mixed
   d) Depends upon the relative values of external and internal resistance

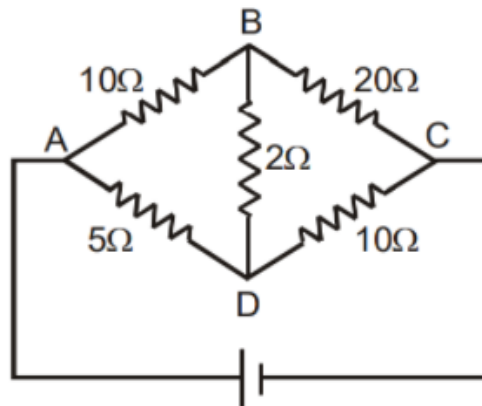54) In the given circuit, the potential of the point E is:

   a) 0
   b) -8V
   c) 4/3V
   d) -4/3V

55) Five resistors of given values are connected together as shown in the figure. The current
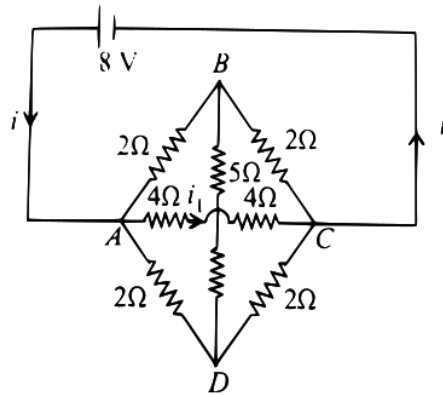

in the arm BD will be
   a) Half the current in the arm ABC
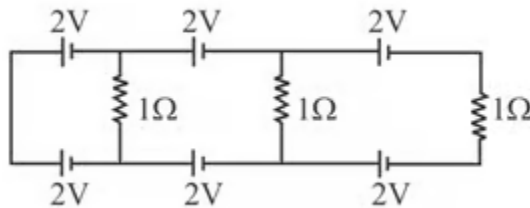   b) 0
   c) Twice the current in the arm ABC
   d) Four times the current in the arm ABC

56) The value of current i_1 flowing from A to C in the circuit diagram is:

a) 2A
b) 4A
c) 1A
d) 5A

57) In the below circuit the current in each resistance is


a) 0.5A
b) 0
c) 1A
d) 0.25A

58) Assertion: Kirchoff's voltage law works only on the principle of conservation of potential but not energy.
Reason: In the loop the voltage supplied does work to move charge across the resistor
a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
b) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).
c) Assertion (A) is true and Reason (R) is false.
d) Assertion (A) is false and Reason (R) is true.

59) A wire of resistivity of 0.0012 ohm - m is used to make two circles and the middle wires acting as diameters in the following figure. if the radius of each circle is 1cm and area of cross section is 0.5 sq mm. then find the resultant resistance of
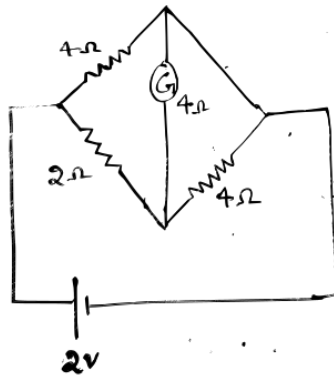
the combination in the figure:(take nearest value)
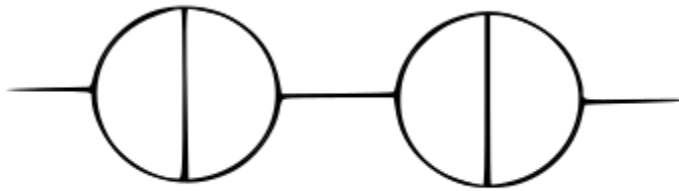
a) 1. 100 ohm
b) 2. 200ohm
c) 3. 172 ohm
d) 4. 150

60)find the power dissipated on 3 ohm resistor (nearly)
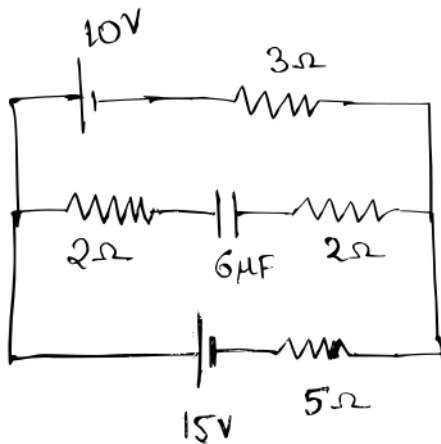
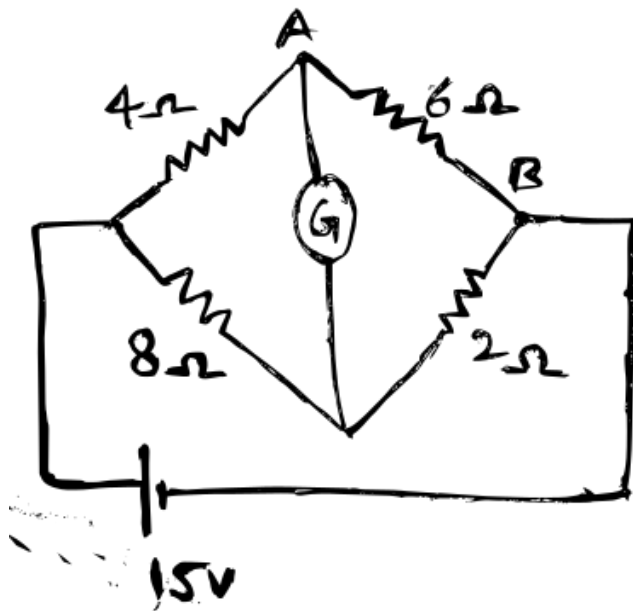a) 0 W
b) 2W
c) 3.2 W
d) 1.2 W

61) In the following circuit, Find the power on 2 ohm resistor

a) 1W
b) 0W
c) 2W
d) 4W

62) How much resistance should be connected across AB parallel to 6 ohm resistor so that galvanometer deflection is zero

a) 6 ohm
b) 4 ohm
c) 12 ohm
d) 10 ohm