Subject- Physics

Objective:
- Revision of concepts
- Skills to carry out research and develop scientific aptitude
- Encouraging learning through experiences

Instructions:
- Neatly write all the answers in your Physics note book.
- Attempt the questions keeping in mind the weightage of each question.
- Assignment 'Summer Holiday Homework' will be created on TEAMS. PDF of handwritten work should be uploaded on it.

Worksheet 1:   **M.M : 25**

Q1(i) Two wire of equal length one copper and other manganin have same resistance. Which wire is thicker? Explain.   (2)

Q2.(i)The variation of potential difference with length in case of two potentiometres A and B is given below. Which of the two is more sensitive ? Explain.
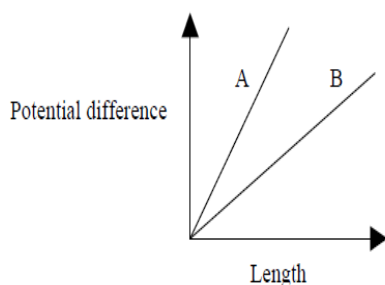

(ii) The amount of charge passing through the cross section of a wire is $q(t)=at^2+bt+c$.Write the dimensional formula for a, b and c. If the values of a, b and c in SI unit are 6, 4, 2 respectively. Find the value of current at t=6 seconds.   (2)

Q3.(i)A wire of resistivity ρ is stretched to three times its initial length, what will be its new resistivity. Explain (ii) If potential difference V applied across a conductor is increased to 2V, how will the drift velocity of the electrons change?   (2)

Q4. A cylindrical metallic wire is stretched to increase its length by 5%. Calculate the percentage change in its resistance.   (2)

Q5. Four cells of identical emf E, internal resistance r, are connected in series to a variable resistor. The graph shows the variation of terminal voltage of the combination with the current output: (i) What is the emf of each cell used? (ii) Calculate the internal resistance of each cell. (iii) For what current from the cells, does maximum power dissipation occur in the circuit?   (2)
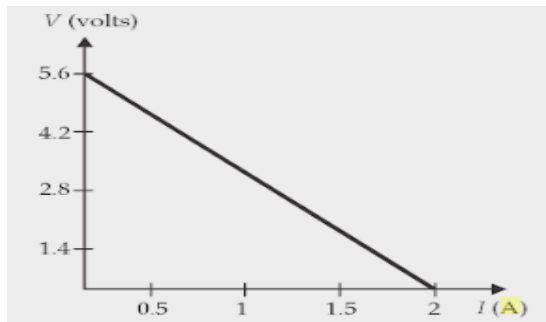
Q6. (i) A heater coil is rated 100 W, 200 V. It is cut into two identical parts. Both parts are connected together in parallel to the same source of 200 V. Calculate the energy liberated per second in the new combination. (ii) A battery of emf 10V and internal resistance 3Ω is connected to a resistor R. (*i*) If current in the circuit is 0.5 A, calculate the value of R. (*ii*) What is the terminal voltage of the battery when the circuit is closed? (3)

Q7(i). Four point charges $q_A = 2\mu C$, $q_B = -5\mu C$, $q_C = 2\mu C$, and $q_D = -5\mu C$ are located at the corners of a square ABCD of side 10 cm. What is the force on charge of $1\mu C$ placed at the centre of the square?(ii) . The electrostatic force on a small sphere of charge 0.4 μC due to another small sphere of charge –0.8 μC in air 0.2N. (**a**) What is the distance between the two spheres? (**b**) What is the force on the second sphere due to the first? (3)

Q8. (i)In circuit shown in fig, Find the value of the unknown resistance X and the current drawn by the circuit from the battery, if no current flows through the galvanometer. Assume the resistance per unit length of the wire AB to be 0.01 Ω/cm.
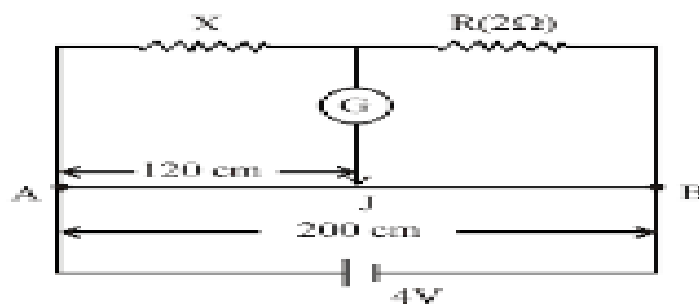
(ii) In the circuit shown, R1 = 4ohm, R2 = R3 = 15 ohm, R4 = 30 ohm and E = 10 V. Calculate the equivalent resistance of the circuit and the current in each resistor.
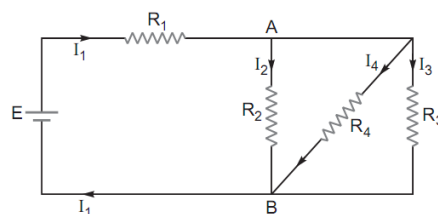
(3)

Q9.(i) At room temperature (27.0°C) the resistance of a heating element is 100 Ω. What is the temperature of the element if the resistance is found to be 117 Ω, given that the temperature coefficient of the material of the resistor is 1.70 x 10^{-4} ° C^{-1}.(ii) Refer to the circuit diagram given below and answer the following questions : (a) Find total resistance of the network across AD .(b) Use Kirchoff's law to find current in all the branches .
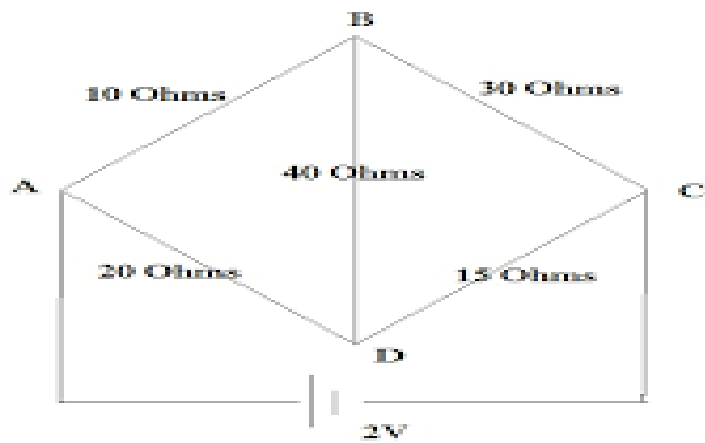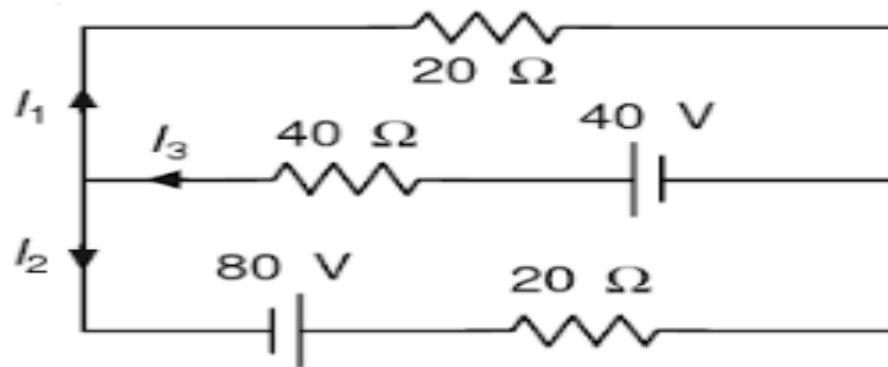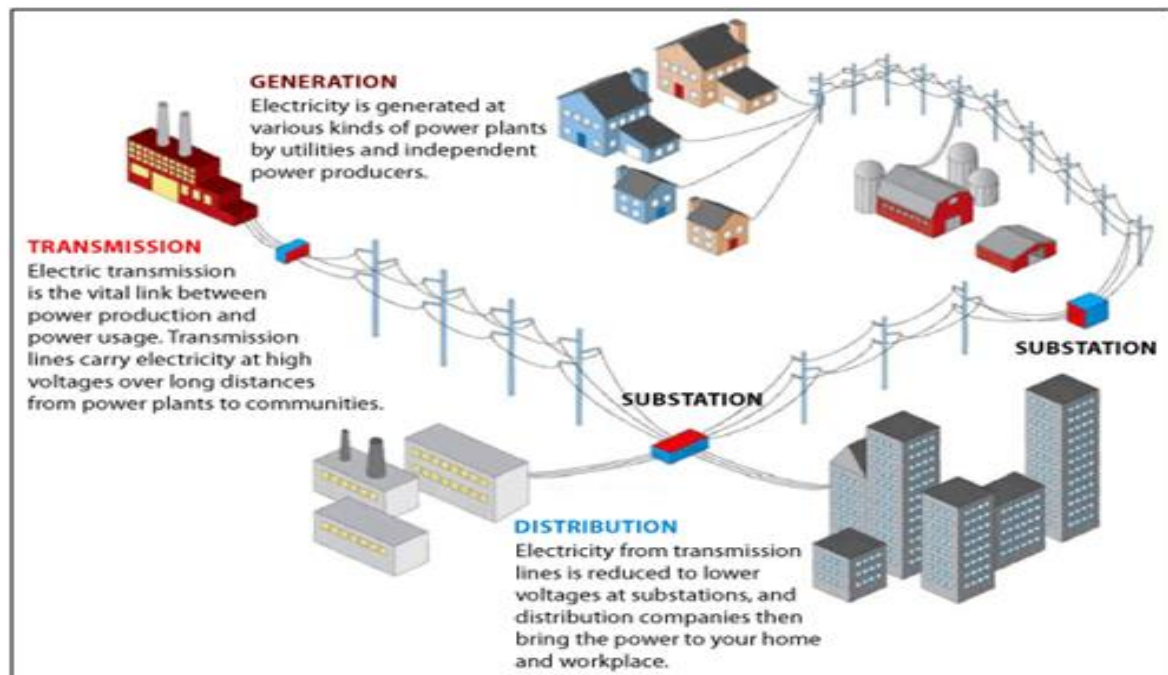
Figure 8.1

(3)

Q.10 State Kirchoff's rules of current distribution in an electric network. Using these rules determine the value of the current in all the branches of the the electric circuit of given fig.

(1+2=3)

Research Project :

Q1. Are transmission lines AC or DC?

Q2 Why transmission of electrical energy is done at High Voltage?

Q3 List five states in India with highest installed electricity generation capacity in Megawatts.

Q4. Check your electricity bill to find out the name of distribution company which supplies electrical energy to your house. Refer to your electricity bill to find out the number of units of electrical energy consumed during the month of April.