

Practice sheet 3

Electricity

1. State Joule's law of heating. List two special characteristics of a heating element wire. (2)
2. An electronic iron consumed energy at the rate of 880 W when heating is at the maximum rate and 440 W when the heating is at the minimum rate. The applied voltage is 220 V. Calculate the current and resistance in each case. (3)
3. Copper and aluminium wires are usually employed for electricity transmission why? (2)
4. (a) What is heating effect of current? List two electrical appliances which work on this effect. (2)
(b) An electric bulb is connected to a 220 V generator. If the current drawn by the bulb is 0.50 A; find its power. (1)
(c) An electric refrigerator rated 400 W operates eight hours a day. Calculate the energy per day in kWh. (1)
(d) State the difference between kilowatt and kilowatt hour. (1)
(e) Why is the series arrangement of appliances not used for domestic circuits? (1)
5. A copper wire has a diameter 0.5 mm and resistivity 1.6×10^{-8} ohm m. (2)
(i) What will be the length of this wire to make the resistance of 12 Ohm
(ii) How much will be the resistance of another copper wire of same length but half the diameter?
6. A wire of uniform cross-section and length l has a resistance of 4 ohm. The wire is cut into four equal pieces. each piece is then stretched to length ' l '. Thereafter, the four wires are joined in parallel. Calculate the net resistance. (2)
7. Calculate the electrical energy produced in 5 minutes when a current of 2 A is sent through a conductor by a potential difference of 500 volts. (2)
8. An electric heater draws a current of 10 A from a 220 V supply. What is the cost of using the heater 5 hours per day for 30 days if the cost of 1 unit is Rs. 2.50? (3)
9. Resistors are given as $R_1 = 10$ ohm, $R_2 = 20$ ohm, and $R_3 = 30$ ohm. Calculate the effective resistance when they are connected in series. Also calculate the current flowing when the combination is connected to a 6 V battery. (3)
10. You have two electric lamps having rating 40 W; 220 V and 60 W; 220 V. Which of the two has a higher resistance? Give reason for your answer. If these two lamps are connected to a source of 220 V, which will glow brighter? (3)
11. Two bulbs A and B are rated as 90 W -120V and 60 W -120 V respectively. They are connected in parallel across a 120 V source. Find the current in each bulb. Which bulb will consume more energy? (2)