

1. Solve

- a. Two lamps, one rated 100 W at 220 V, and the other 60 W at 220 V, are connected in parallel to electric mains supply. What current is drawn from the line if the supply voltage is 220 V?
- b. Which uses more energy, a 250 W TV set in 1 hr, or a 1200 W toaster in 10 minutes?
- c. An electric heater of resistance $8\ \Omega$ draws 15 A from the service mains 2 hours. Calculate the rate at which heat is developed in the heater.

2. Explain the following.

- a. Why is tungsten used almost exclusively for filament of electric lamps?
- b. Why are the conductors of electric heating devices, such as bread-toasters and electric irons, made of an alloy rather than a pure metal?
- c. Why is the series arrangement not used for domestic circuits?
- d. How does the resistance of a wire vary with its area of cross-section?

3. Explain

- a. How does a solenoid behave like a magnet? Can you determine the north and south poles of a current-carrying solenoid with the help of a bar magnet? Explain.
- b. When is the force experienced by a current-carrying conductor placed in a magnetic field largest?
- c. Two circular coils A and B are placed close to each other. If the current in the coil A is changed, will some current be induced in the coil B? Give reason.
- d. List two methods of producing magnetic fields.

4. Solve

- a. Compute the heat generated while transferring 96000 coulomb of charge in one hour through a potential difference of 50 V.
- b. An electric iron of resistance $20\ \Omega$ takes a current of 5 A. Calculate the heat developed in 30 s.
- c. Electric lamp of resistance 20 ohms and a conductor of 4 ohms resistance are connected to a 6 volt battery. Calculate total resistance, current, and potential difference across electrical lamp and conductor.