

29. A 996 W hair dryer is designed to carry a peak current of 11.8 A.
- How large is the rms current in the hair dryer?
 - What is the rms emf across the hair dryer?

AC CIRCUITS AND TRANSFORMERS

Review Questions

30. Which quantities remain constant when alternating currents are generated?
31. How does the power dissipated in a resistor by an alternating current relate to the power dissipated by a direct current that has potential difference and current values that are equal to the maximum values of the alternating current?

Conceptual Questions

32. In a Ground Fault Interrupter, would the difference in current across an outlet be measured in terms of the rms value of current or the actual current at a given moment? Explain your answer.
33. Voltmeters and ammeters that measure ac quantities are calibrated to measure the rms values of emf and current, respectively. Why would this be preferred to measuring the maximum emf or current?

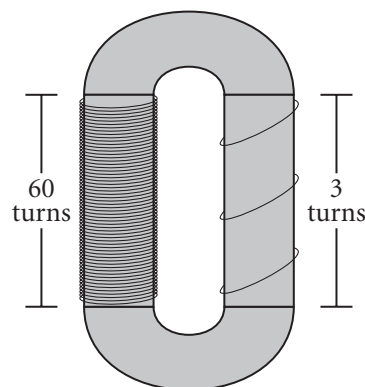
Practice Problems

For problems 34–37, see Sample Problem C.

34. A transformer is used to convert 120 V to 9.0 V for use in a portable CD player. If the primary, which is connected to the outlet, has 640 turns, how many turns does the secondary have?
35. Suppose a 9.00 V CD player has a transformer for converting current in Great Britain. If the ratio of the turns of wire on the primary to the secondary coils is 24.6 to 1, what is the outlet potential difference?
36. A transformer is used to convert 120 V to 6.3 V in order to power a toy electric train. If there are 210 turns in the primary, how many turns should there be in the secondary?

37. The transformer shown in the figure below is constructed so that the coil on the left has five times as many turns of wire as the coil on the right does.

- If the input potential difference is across the coil on the left, what type of transformer is this?
- If the input potential difference is 24 000 V, what is the output potential difference?



ELECTROMAGNETIC WAVES

Review Questions

38. How are electric and magnetic fields oriented to each other in an electromagnetic wave?
39. How does the behavior of low-energy electromagnetic radiation differ from that of high-energy electromagnetic radiation?

Conceptual Questions

40. Why does electromagnetic radiation obey the inverse-square law?
41. Why is a longer antenna needed to produce a low-frequency radio wave than to produce a high-frequency radio wave?

MIXED REVIEW PROBLEMS

42. A student attempts to make a simple generator by passing a single loop of wire between the poles of a horseshoe magnet with a 2.5×10^{-2} T field. The area of the loop is $7.54 \times 10^{-3} \text{ m}^2$ and is moved perpendicular to the magnetic field lines. In what time interval will the student have to move the loop out