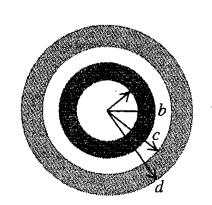
22.45. Concentric Spherical Shells. A small conducting spherical shell with inner radius a and outer radius b is concentric with a

larger conducting spherical shell with inner radius c and outer radius d (Fig. 22.39). The inner shell has total charge +2q, and the outer shell has charge +4q. (a) Calculate the electric field (magnitude and direction) in terms of q and the distance r from the common center of the two shells for (i) r < a; (ii) a < r < b; (iii) b < r < c; (iv) c < r < d; (v) r > d. Show your results in a graph of the radial component of \vec{E} as a

Figure **22.39** Problem 22.45.



function of r. (b) What is the total charge on the (i) inner surface of the small shell; (ii) outer surface of the small shell; (iii) inner surface of the large shell; (iv) outer surface of the large shell?