5 **(a)** In many distribution systems for electrical energy, the energy is transmitted using alternating current at high voltages.

Suggest and explain an advantage, one in each case, for the use of

(i) alternating voltages,

……

……

……[1]

(ii) high voltages.

……

……

……

……[2]

(b) A simple transformer is illustrated in Fig. 5.1.

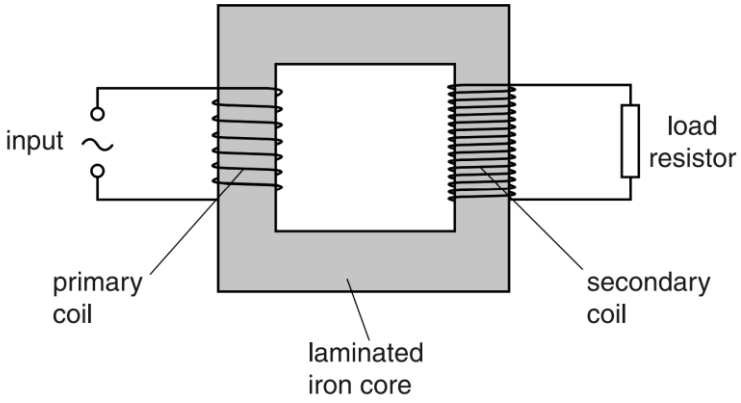

Fig. 5.1

Explain

(i) why the iron core is laminated,

……

……

……[2]

(ii) what is meant by an *ideal* transformer.

……

……[1]

(c) An ideal transformer has 300 turns on the primary coil and 8100 turns on the secondary coil. The root-mean-square input voltage to the primary coil is 9.0 V.

Calculate the peak voltage across the load resistor connected to the secondary coil.

peak voltage = ……..…….… V [1]