4 **(a)** Electrical energy is usually transmitted using alternating current. Suggest why the transmission is achieved using

(i) high voltages,

.....

.....

.....

..... [2]

(ii) alternating current.

.....

..... [1]

(b) An ideal iron-cored transformer is illustrated in Fig. 4.1.

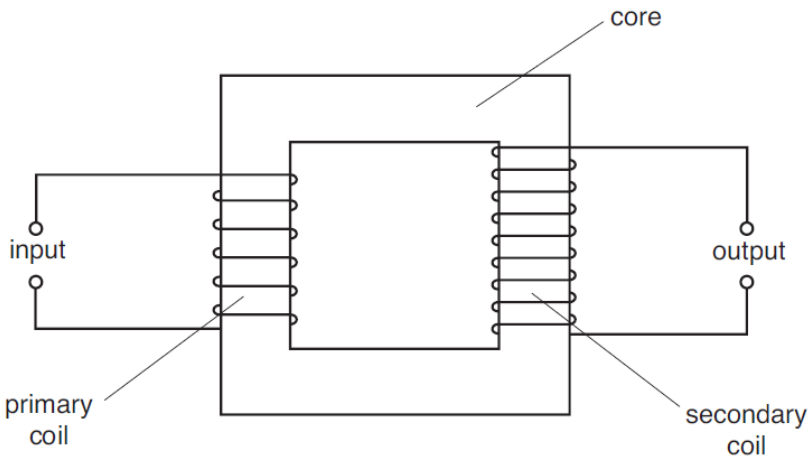

Fig. 4.1

Explain

(i) why the iron core is laminated,

.....

..... [1]

(iii) the input voltage in the primary coil is not in phase with the e.m.f. induced in the secondary coil.

.....

.....

.....

..... [2]

(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 [2]