

- 7 A d.c. converter converts direct steady voltage V into an alternating voltage of root-mean-square value V_{rms} . The output voltage V_{rms} from the d.c. converter is equal to V .

Fig. 7.1 shows a steady d.c. supply of 2.4 V connected to the d.c. converter. The output from the d.c. converter is connected to a transformer to step up the voltage so that it can power a camera flash lamp.

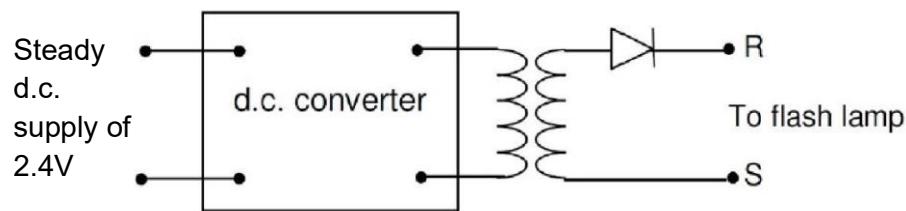


Fig. 7.1

- (a) The ratio of the number of turns in the primary coil to the secondary coil is 1:50, calculate the maximum output voltage of the transformer.

$$\text{maximum output voltage} = \dots \text{V} [2]$$

- (b) Fig 7.2 shows the variation with time of the output voltage across RS.

$$V / V$$

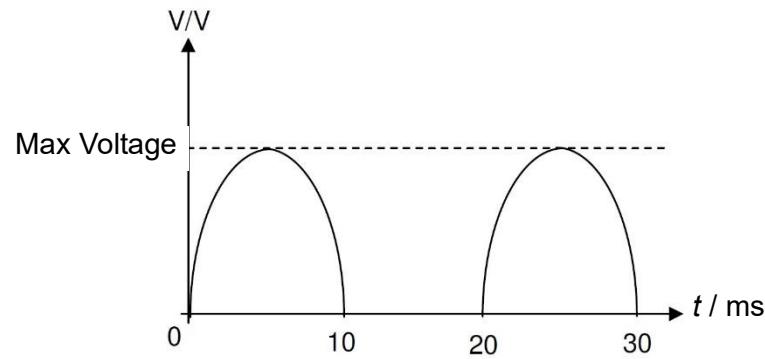


Fig. 7.2

The resistance of the flash lamp is 47Ω . Calculate the average power supplied to the flash lamp.

$$\text{average power} = \dots \text{W} [2]$$

- (c) The diode in Fig. 7.1. is replaced with a network of diodes to produce the output voltage across RS as shown in Fig. 7.3.

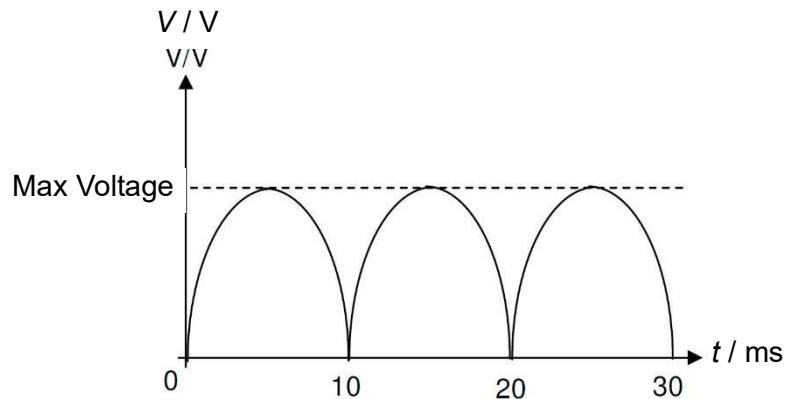


Fig. 7.3

Determine the new average power supplied to the same flash lamp.

$$\text{power} = \dots \text{W} [1]$$

- (d) Explain whether Fig. 7.3 represents an alternating voltage or a direct voltage.

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..... [1]

- (e) Explain why it is necessary to have a d.c. converter.

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[1]

[Total: 7]

Section B

Answer **one** question from this Section in the spaces provided.