Section B

Answer **two** of the questions from this section.

6 This question considers energy in many different forms.

(a) Describe the relationship between potential energy and work.

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.....[1]

(b) A car of mass 1260 kg is travelling in a town at 50 kilometres per hour. It crashes into a lorry and is brought to rest in a distance of 0.86 m.

(i) Calculate the kinetic energy of the car before the collision.

kinetic energy = ... J [2]

(ii) Assume that the force exerted on the lorry by the car is constant during the crash. Calculate the magnitude of this average force F_a.

F_a = ... N [2]

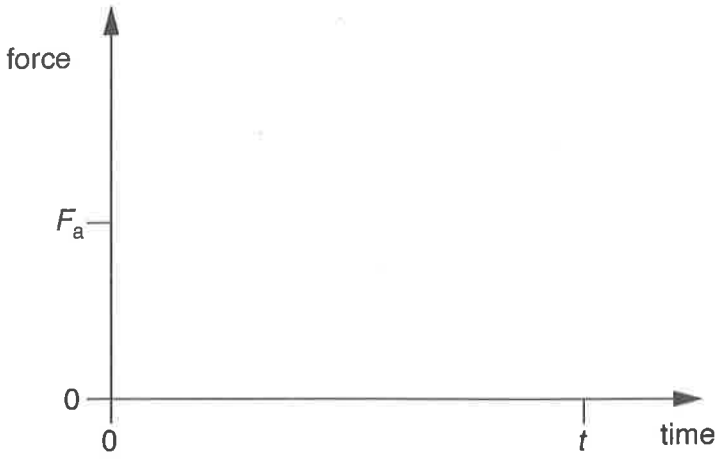
(iii) Calculate the time t it takes the car to stop.

t = ... s [3]

(iv) In fact, the force exerted on the lorry by the car during the crash is not constant.

On Fig. 6.1, sketch a graph to show how this force varies with time.

The values for F_a and t are shown on the axes.



[3]

Fig. 6.1

(c) Gravitational, electric and elastic energies are usually classified as potential energies.

Explain what is meant by each of these energy terms.

Describe why each is considered to be a *potential* energy.

(i) gravitational potential energy .....

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(ii) electric potential energy .....

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(iii) elastic potential energy .....

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[5]

(d) Describe the photoelectric effect and explain the part that energy plays in causing this effect.

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.....[4]