

Energy & Power

Question Paper

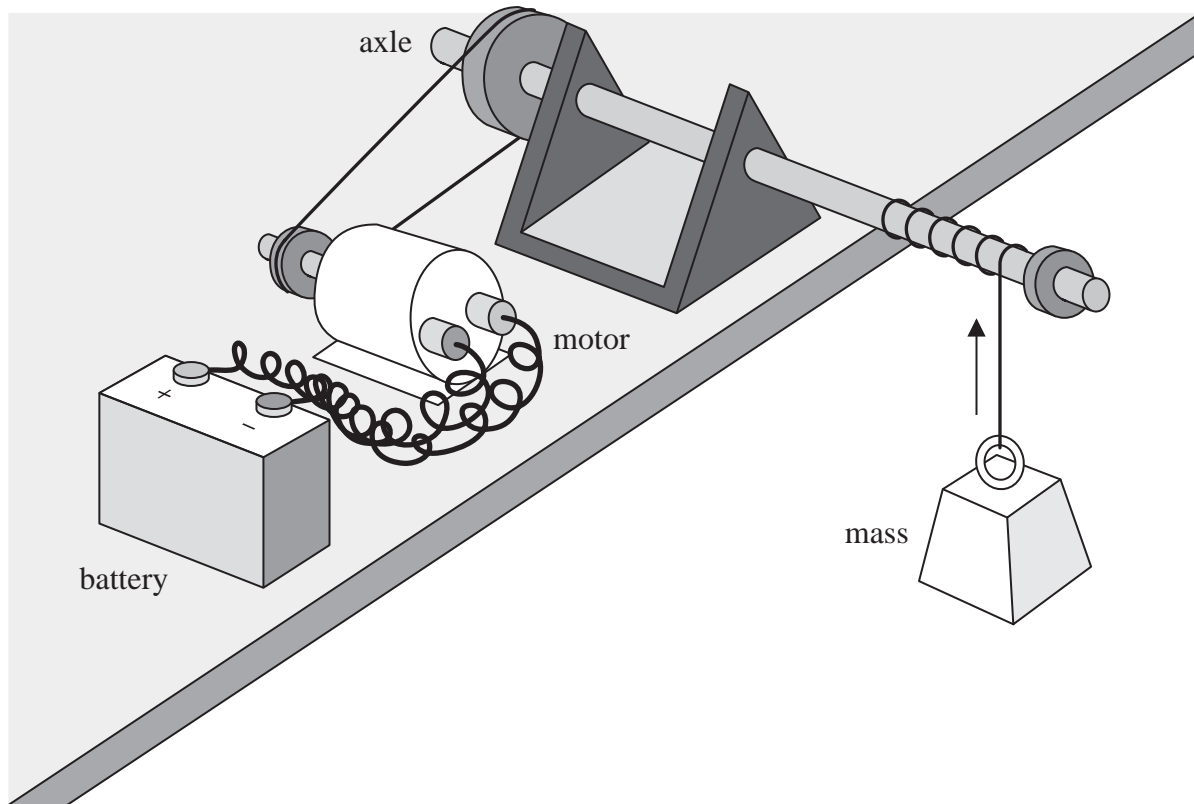
Level	International A Level
Subject	Physics
Exam Board	Edexcel
Topic	Mechanics
Sub Topic	Energy & Power
Booklet	Question Paper

Time Allowed:	54 minutes
Score:	/45
Percentage:	/100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

- 1 A student is asked to determine the efficiency of a 9 V electric motor when it is used to lift a 1 kg mass at a steady speed. The diagram below shows the apparatus to be used.



Write a plan for an experiment to do this.

You should:

- (a) state the quantities to be measured, (2)
- (b) explain your choice of measuring instrument for **two** of these quantities, (4)
- (c) comment on whether repeat readings are appropriate in this case, (1)
- (d) explain how the data collected will be used to calculate the efficiency of the motor, (3)
- (e) identify the main sources of uncertainty and/or systematic error, (2)
- (f) comment on safety. (1)

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(Total for Question 1 = 13 marks)

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(Total for Question 2 = 14 marks)

- 3 A student carried out an experiment to investigate the stretching of a length of rubber of rectangular cross-section. His results are shown below.

original length of rubber = 0.15 m

thickness of rubber = 1.05×10^{-3} m

width of rubber = 2.71×10^{-3} m

Extension / m	Force / N
0	0
0.0225	3.9
0.05	7.9
0.13	9.8
0.235	12.4
0.3	14.0
0.35	18.5

- (a) Criticise these results.

(2)

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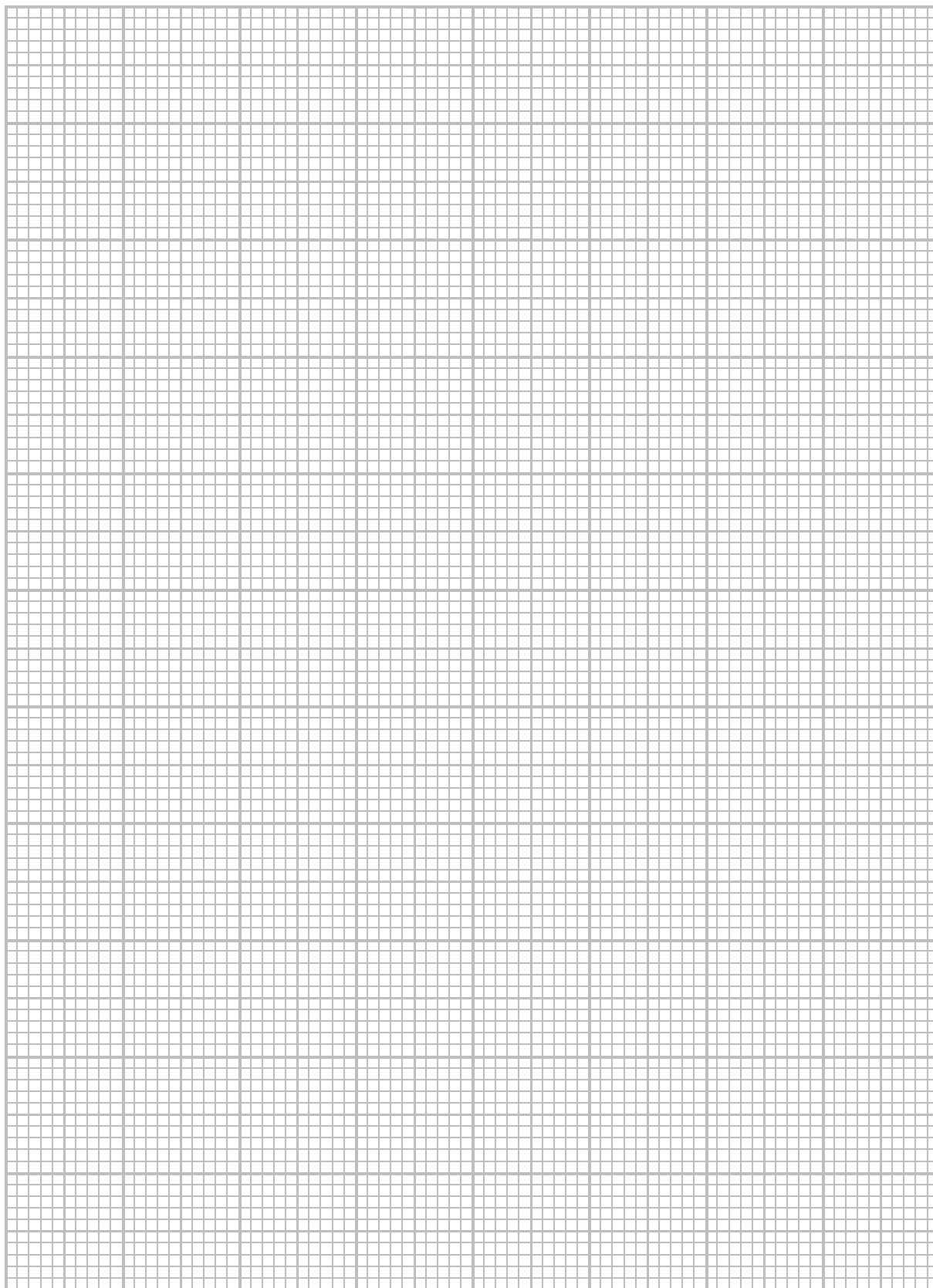
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- (b) (i) Plot a graph of force on the y-axis and extension on the x-axis and draw a line of best fit.

(4)

Force/N



Extension/m

(ii) Comment on the shape of the graph.

(2)

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(iii) The area under the graph represents the work done in stretching the rubber.
Determine the work done in stretching the rubber by 0.2 m.

(4)

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Work done =

(c) For the last set of results in the table calculate the stress and strain. State an assumption you have made.

(6)

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Stress =

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Strain =

Assumption.....
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(Total for Question 3 = 18 marks)
