

Forces and Elasticity

Mark Scheme

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Physics
Exam Board	AQA
Topic	6.5 Forces
Sub-Topic	Forces and Elasticity
Difficulty Level	Gold Level
Booklet	Mark Scheme

Time Allowed: 22 minutes

Score: /21

Percentage: /100

Grade Boundaries:

- M1.(a)** force = spring constant \times extension
accept $f = ke$ 1
- (b) extension is directly proportional to the force applied 1
- because it is straight line through the origin 1
- (c) test a greater range of load
or
test more springs 1
- (d) work done is equal to elastic potential energy 1
- as long as the spring does not go past the limit of proportionality 1
- (e) line extending with a greater gradient than existing line 1
- a stiffer spring has a greater spring constant (k) 1
- $k = F / e$ 1

- (f) the spring will be deformed
accept not gone back to original shape

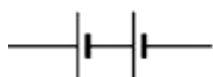
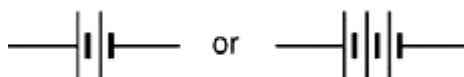
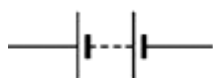
1

because it has passed the elastic limit

1

[11]

- M2.** (a) (i) ammeter and battery **in series** with the **gauge**
symbols must be correct
ignore a voltmeter drawn in series
accept



not



or cells reversed to cancel out

1

voltmeter in parallel with the gauge
symbol must be correct
accept a freestanding circuit
diagram provided strain gauge is labelled or a resistor
symbol used for the strain gauge

1

- (ii) d.c. flows only in one direction
a.c. changes direction is insufficient

1

- (b) (i) 75

this answer only

allow 1 mark for correct substitution **and** transformation,

$$\text{ie resistance} = \frac{3.0}{0.040}$$

2

- (ii) increases

1

- (iii) elastic / strain potential
do **not** accept potential

1

[7]

- M3.** (a) **F** 50 cm on first part of graph
tolerance + **or** – 3cm

1

- (b) **S** at the far right
credit anywhere to right of last trough

1

- (c) **M** on any two tops of peaks **or** bottoms of troughs
both are required for the mark *M* needs to be central to the trough **or** peak, except if *F* is in the way in one case

1

[3]

