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IGCSE PHYSICS 0625 · TOPICAL PAST PAPERS

Forces & Elastic Deformation — Paper 1

Worked Answer Key (Multiple Choice)

Fahad H. Ahmad

Contact: **+92 323 509 4443**

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Forces & Elastic Deformation — Paper 1 · Worked Answer Key

These are **Megalecture worked answers** for the topical multiple-choice compilation on **Forces & Elastic Deformation (IGCSE Physics 0625, Paper 1)**. Every answer below was solved from first principles by the Megalecture team. Numerical items use Hooke's law (force is proportional to extension, $F = kx$, up to the limit of proportionality) and the data given in each question. Use this key to mark your work and to see the one-line reasoning behind each correct letter.

Elastic Deformation

Q #	Exam reference	Answer	Brief working / reason
1	M/J 16 P11	D	A force can change a body's shape (deformation), velocity (acceleration) and volume (compression), but it cannot change its mass . The only list with no "mass" is shape, velocity, volume .
2	M/J 17 P11	B	The line is straight at first, then bends towards the extension axis so a given increase in load now produces a smaller extra extension — i.e. the wire becomes harder to extend at a certain load (it has passed the limit of proportionality and is stiffening).
3	M/J 17 P12	A	The limit of proportionality is the point where the load–extension line stops being straight. The graph is straight only up to A ; beyond A it curves, so A is the limit of proportionality.
4	M/J 18 P11	D	"Most difficult to stretch" = least extension for a given load = the lowest, shallowest curve. Curve D gives the smallest extension across the whole load range, so fibre D is hardest to stretch.
5	M/J 19 P12	A	Load is proportional to extension only along the initial straight section. The line is straight up to A and curves afterwards, so the limit of proportionality is at point A .
6	M/J 19 P12	B	Removing the load lets the (elastic) wire return towards its original size, so its length changes. Mass, melting point and the isotope's half-life are unaffected by removing a load → length of the wire .
7	M/J 20 P12	D	Hooke's law: extension $\propto$ load. 6.0 N gives 4.0 cm, so 3.0 N gives 2.0 cm. Total length = original + extension = 15.0 + 2.0 = 17.0 cm .
8	O/N 17 P11	C	Extension $\div$ mass is constant (0.175 mm/kg) up to 6.0 kg, then rises (0.1875 at 8.0 kg). Proportionality is lost somewhere between 6.0 kg and 8.0 kg, so the limit lies 6.0 kg and 8.0 kg .
9	O/N 18 P12	D	For the same spring, more extension per kg means a larger weight (force) per kg, i.e. a stronger field. Slope: planet X $\approx$ 50 cm at 3 kg,

Q #	Exam reference	Answer	Brief working / reason
			planet Y $\approx$ 30 cm at 6 kg, a ratio of 3. So g on X is three times that on Y.
10	O/N 19 P11	D	In parallel, each spring shares the load and extends x . In series, each spring carries the full load L , so each extends $2x$; two of them give a total extension of $2x + 2x = 4x$.
11	O/N 20 P11	A	On an extension–load graph, proportionality holds while the plot is a straight line through the origin. It is straight only up to point A ; beyond A the curve steepens, so A marks the limit of proportionality.

Note from Megalecture. These are original Megalecture worked solutions prepared for revision use. Where a graph defines the limit of proportionality, look for the last point on the straight, through-the-origin section; where numbers are given, apply Hooke's law ($F = kx$) directly.