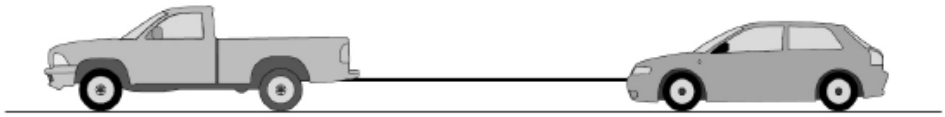
Materials – A2 Physics P1 2022

1. June /2022/Paper_ 7408/1/No.24

A truck of mass 2.1×10^3 kg tows a car of mass 1.3×10^3 kg along a horizontal road.
The total resistive force on the car is 1100 N.
The acceleration of the car and truck is 2.3 m s^{-2}.



What is the tension in the tow rope?

[1 mark]

A 3000 N ⬭

B 4100 N ⬭

C 7800 N ⬭

D 8900 N ⬭

2. June /2022/Paper_ 7408/1/No.27

A mass M is suspended from a spring. When the mass is at rest at the equilibrium position, the elastic potential energy stored is E.
An extra mass of $2M$ is added to the spring and the spring extends while still obeying Hooke's law.

What is the total elastic energy stored when the system is at rest at the new equilibrium position?

[1 mark]

A $2E$ ⬭

B $3E$ ⬭

C $4E$ ⬭

D $9E$ ⬭

3. June /2022/Paper_ 7408/1/No.28

Two wires P and Q are made of the same material and have the same cross-sectional area.
P has an original length L and is subject to a tensile force F. P extends a distance x.
Q has an original length $2L$ and is subject to a tensile force $2F$.

Which statement is correct?

[1 mark]

A The stress in P and the stress in Q are the same. ⬭

B The extension of Q is $2x$. ⬭

C The strain of Q is double the strain of P. ⬭

D The value of $\frac{\text{stress}}{\text{strain}}$ for P is half that of Q. ⬭

4. June /2022/Paper_ 7408/1/No.30

Which value of resistance **cannot** be made by combining three $10\ \Omega$ resistors?

[1 mark]

A $3.3\ \Omega$ ⬭

B $6.7\ \Omega$ ⬭

C $15\ \Omega$ ⬭

D $25\ \Omega$ ⬭