**Extension Challenge Questions**

Level of difficulty (i) Moderate → (V) Exceptional

1. A metal spring is compressed and tied with some acid resistant ribbon. The spring is then added to a beaker containing some acid solution. The acid will dissolve the metal. What has happened to the potential energy that was stored in the spring? (ii)
2. When speaking in a sound proof room we do not hear a noise indefinitely. What has happened to the energy that the sound wave had? (i)
3. A rubber ball is dropped from a height of 1.0 m and bounces to a height of 0.8 m. Where has the “lost” potential energy gone? (i)
4. Sketch 3 graphs on the same set of axis of energy vs time that show the variation of Ek, Ep and total energy with time that occurs when an object is dropped. (iv)
5. Re-sketch the graphs of question 4 to show what they would look like if there was a significant amount of wind resistance as the object fell. (v)
6. A pendulum bob is pulled back so the string makes an angle of 60⁰ with the vertical. What is the maximum speed achieved by the pendulum if the string is 2 m long? (iii)

Good Luck