# 6. Work energy and power

6.1 Energy conversion and conservation

6.2 Work

6.3 Potential energy, kinetic energy and internal energy

6.4 Power

# Candidates should be able to:

*(a)* give examples of energy in different forms, its conversion and conservation, and apply the principle of energy conservation to simple examples

*(b)* show an understanding of the concept of work in terms of the product of a force and displacement in the direction of the force

*(c)* calculate the work done in a number of situations including the work done by a gas that is expanding against a constant external pressure: *W* = *p* Δ*V*

*(d)* derive, from the equations of motion, the formula for Ek

*(e)* recall and apply the formula Ek = ½ mv2

*(f)* distinguish between gravitational potential energy, electric potential energy and elastic potential energy

*(g)* show an understanding and use the relationship between force and potential energy in a uniform field to solve problems

*(h)* derive, from the defining equation *W* = *Fs*, the formula *E*p = *mgh* for potential energy changes near the Earth’s surface

*(i)* recall and use the formula *E*p = *mgh* for potential energy changes near the Earth’s surface

*(j)* show an understanding of the concept of internal energy

*(k)* show an appreciation for the implications of energy losses in practical devices and use the concept of efficiency to solve problems

*(l)* define power as work done per unit time and derive power as the product of force and velocity

*(m)* solve problems using the relationships *P* = *W/t* and *P* = *Fv*.

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# Paper 2 Questions

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