1) D
2) C
3) B
4) D
5) D
6) D
7) D
8) B
9) C
10)

(a) **(i)** $v^2 = 2as$		
$1.2^2 = 2 \times a \times 1.9$	M1	
$a = 0.38\ \text{m s}^{-2}$	A1	[2]
(ii) $F = ma$		
$= 42 \times 0.38$	M1	
$= 16\ \text{N}$	A0	[1]
(b) *power* $= Fv$	C1	
$= 16 \times 1.2$		
$= 19\ \text{W}$	A1	[2]

11)

(a) **(i)** potential energy: stored energy available to do work	B1	[1]
(ii) gravitational: due to height/position of mass OR distance from mass OR moving mass from one point to another	B1	
elastic: due to deformation/stretching/compressing	B1	[2]
(b) **(i)** height raised = (61 – {61 cos18} =) 3.0 cm	C1	
energy = (*mgh* = 0.051 × 9.8 × 0.030 =) 1.5×10^{-2} J	A1	[2]

12)

(a) **(i)** product of force and distance moved	M1	
(by force) in the direction of the force	A1	[2]
(ii) work (done) per unit time (*idea of ratio needed*)	B1	[1]
(b) *either* work/time *or* power = (force × distance)/time	M1	
to give power = force × velocity	A1	[2]
(c) **(i)** kinetic energy (= $\frac{1}{2}mv^2$) = ½ × 1900 × 27^2	C1	
power = 692550 / 8.1 = 8.55×10^4 W	A1	[2]
(ii) *either* for equal increments of speed, increments of E_K are different	M1	
so longer time (to increase speed) at high speeds	A1	[2]
or air resistance increases with speed (M1)		
so driving force (and acceleration) reduced (A1)		
or P (= Fv) = mav (M1)		
(P and m constant) so when v increases, a decreases (A1)		

13)
14)
15)
16)
17)
18)
19)
20)