Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

(a) elastic potential

1

(b) (i) line is straight

accept line does not curve

1

(ii) 400

*allow **1** mark for correct substitution of any pair of numbers correctly taken from the graph e.g.160 = k × 0.40*

2

newtons per metre **or** N/m

if symbols are used they must be correct

1

(iii) 300

*allow **1** mark for correctly obtaining force on 1 spring = 100N*

2

(c) 52

*allow **2** marks for calculating change in gpe for 1 chin-up as 260 (J) or for 12 chin-ups as 3120 (J)*

*an answer 4.3 gains **2** marks*

*allow **1** mark for correct substitution into gpe equation ie gpe = 65 × 10 × 0.4 (× 12)*

or

correct use of power equation with an incorrect value for energy transferred

3

[10]

Q2.

(a) energy required to raise the temperature of a substance by 1 °C

accept heat for energy

1

unit mass / 1 kg

1

(b) (i) 7 140 000 (J)

allow 2 marks for a correct substitution, ie

E = 20 × 420 × 850
provided no subsequent step
*850 gains **1** mark if no other mark awarded*

3

(ii) particles in the air have more (kinetic) energy than the particles in the steel
allow particles in the air have a greater speed.

1

steel
particles vibrate (about fixed positions)

1

air
particles move freely

1

(ii) the most energetic particles
accept molecules for particles throughout
accept the fastest particles

1

have enough energy to escape from (the surface of) the water

1

therefore the mean energy of the remaining particles decreases
accept speed for energy

1

as energy decreased, temperature has decreased

1

[12]