Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a)

*an answer of 0.50 scores **3** marks*
*allow a correct answer that rounds to 0.50 for **3** marks*

$$41 = \frac{9.8 \times h}{0.12}$$

1

$$h = \frac{41 \times 0.12}{9.8}$$

1

h = 0.50 (m)

1

(b) kinetic energy = 0.5 × mass × (speed)^2
or
$E_k = ½\ mv^2$

1

(c)

*an answer of 60 (kg) scores **3** marks*

$270 = ½ \times m \times 3^2$

1

$$m = \frac{270}{(½ \times 3^2)}$$

or

$$m = \frac{270}{4.5}$$

1

m = 60 (kg)

1

(d) **Level 2:** Scientifically relevant features are identified; the way(s) in which they are similar / different is made clear.

3–4

Level 1: Relevant features are identified and differences noted.

1–2

No relevant content

0

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Indicative content

- males have a greater muscle power than females for most of their lives
- males have a greater muscle power than females above 9/10 years old
- males have a lower muscle power than females below 9/10 years old
- there is a similar pattern for males and females as age increases
- males have a peak muscle power at 25 years old whereas females have a peak muscle power at 20/21 years old
- at 9/10 years old males have the same muscle power as females
- peak muscle power for males (47 W/kg) is greater than peak muscle power for females (37 W/kg)
- the rate of increase of muscle power is greater for males than females (between 5 and 25 years old)
- the rate of decrease of muscle power is greater for males than females.

Ignore comments relating to strength

(e) any **1** from:

- maximum height reached is a better indicator of maximum muscle power

  allow maximum time in the air for maximum height reached / jumped
- maximum / peak muscle power was being investigated, not mean / average muscle power
- volunteer may not use maximum effort on the first try
- performance may improve with practice
- performance may get worse with tiredness

1

[12]

Q2.

(a) gravitational potential

1

kinetic

1

chemical

1

(b) flying drones may damage aircraft
or
falling drones may injure people
or
damage buildings / vehicles

allow any sensible suggestion of a hazard caused by a flying / falling drone

1

(c) energy transferred = power × time

allow E = Pt

1

(d) t = 25 × 60 = 1500 (s)

1

E = 65 × 1500

1

E = 97 500 (J)

an answer of 97 500 (J) scores 3 marks

allow 2 marks for an answer of 1625 (J)

1

[8]

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