New Specification

cea

Rewarding Learning

General Certificate of Secondary Education
2012–2013

Double Award Science: Physics

Unit P1

Foundation Tier

[GSD31]

WEDNESDAY 14 NOVEMBER 2012
1.30 pm–2.30 pm

MARK
SCHEME

1 **(i)** strain/elastic [1]

   (ii) kinetic [1]

   (iii) potential/gravitational [1]

   (iv) chemical [1]

4

2 **(a)** distance is a scalar/displacement is a vector/
       displacement involves direction [1]

   (b) (i) Stopped or at rest [1]

       (ii) (Av) speed = (total) distance/(total) time [1]
                = 120/100 [1]
              = 1.2 (m/s) [1]

5

3 **(a) (i)** Weight/gravity [1]

       (ii) 30 (N) [1]

       (iii) Reaction [1]
              30 (N) Allow e.c.f. from **(a) (ii)** [1]
              Upwards [1]

   (b) Friction [1] [NB: not drag]

6

4 **(i)** W = F × d [1]
        = 75 × 12 [1]
        = 900 (J) [1]

   (ii) Food [1]

   (iii) E = (useful) energy out/(total) energy in [1]
          = 900/4500 [1] e.c.f. from **(i)**
          = 0.2 [1] (or 20%)

7

5 **(a)** The point [1] where weight (appears to) act [1]

   (b) (i) Moment = F × d [1]
                  = 12 × 80 [1]
                  = 960 [1] Ncm [1]

       (ii) Anticlockwise [1]

7

6 **(a)** **(i)** Immerse stone (in liquid) [1]
in a <u>measuring cylinder</u> [1]
find difference in readings [1]
OR (Eureka vessel method)
Add stone [1] <u>filled</u> eureka vessel [1] or displacement can
measure overflow [1]

    (ii) Precaution: e.g. stone fully immersed or ensure no splashing [1]

(b) $\rho = m/v$ [1]
   $= 320/40$ [1]
   $= 8$ (g/cm^3) [1]

7 7

	Name	Relative mass	Relative charge
▦	electron		-1
❶	proton	1	
❶		1	0 or neutral

1 mark each [6]   6

8 **(a)** **(i)** C [1]   **(ii)** A [1]   **(iii)** B [1]

(b) **(i)** Ionisation [1]

    (ii) Lose or gain electron/s [1]

(c) e.g. Any two from:
Use tongs/keep distance large [1]
Keep exposure time low [1]
Use shielding/wear protection [1]/safety badge/film badge

(d) <u>Time</u> [1] for activity to halve [1] [dept. marking]   9

9 (a) Find weight (or mass and multiply by 10) [1]
Find total height of stairs [1]
Time to climb stairs [1]
Power = (weight × height)/time; [1]
Any two instruments from scales/metre stick/stop clock [2]
[1 mark each]

AVAILABLE
MARKS

Response	Mark
Candidates give **5 or 6** of the above points. They use good spelling, punctuation and grammar. The form and style are of a high standard and specialist terms are used appropriately.	[5–6]
Candidates explain **3 or 4** of the above points. They use satisfactory spelling, punctuation and grammar. The form and style are of a satisfactory standard and they have made use of some specialist terms.	[3–4]
Candidates explain **1 or 2** of the above points. They use limited spelling, punctuation and grammar. The form and style is of a limited standard and they have made no use of specialist terms.	[1–2]
Response not worthy of credit.	[0]

[6]

(b) P = Work done/time taken (no marks)
= (3800)/5 [1]
= 760 [1]
= 0.76 (kW) [1] [3]

9

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10 (i)

Depth h in m	0	10	20	30	40	50
W in bar	0	1	2	3	4	5
Total pressure in bar	*1*	*2*	*3*	*4*	*5*	*6*

3 or 4 correct [1]
All correct [2]   [2]

(ii) Vertical axis numbered with uniform scale [1], scale more than half [1]
3 or 4 correct [1]
5 or 6 points [2]   [4]

(iii) Best fit line [1]

(iv) Intercept (on vertical axis) OR when h = 0 pressure is 1 (bar) [1]

(v) 4.5 bar [1]

(vi) Line does not go through origin [1]

10

Total | **70**