MARK SCHEME

GCSE
PHYSICS
AQA - TRIPLE SCIENCE

P3 - TEST 1
PARTICLE MODEL OF MATTER
Beginner

Mark schemes

1.   (a)   (i)   random distribution of circles in the box with at least 50 % of circles touching

1

random distribution of circles occupies more than 50 % of the space
> *judged by eye*

1

(ii)   (large) gaps between particles
> *accept particles do not touch*
> *accept particles are spread out*

1

(so) easy to push particles closer (together)
or
forces between particles are negligible / none
> *an answer in terms of number of particles is insufficient*

1

(b)   (i)   (both are) random
> *accept a correct description of random eg unpredictable or move*
> *around freely or in all directions*
> *they take up all the space is insufficient*
> *they are spread out is insufficient*
> *they move in straight lines is insufficient*

1

(ii)   (speed also) increases

1

[6]

2.   (a)   0 to 25 cm^3

1

(b)   control

1

(c)   2 sets of data recorded from line of best fit to show that the product
is the same in both cases (1600)
> *allow for **1** mark one set of calculated data for one point on the line*
> *of best fit*

2

(d)   decreases

1

increases

1

increases

1

[7]

3. (a) **Level 2:** The method would lead to the production of a valid outcome. Key steps are identified and logically sequenced.

3−4

Level 1: The method would not necessarily lead to a valid outcome. Some relevant steps are identified, but links are not made clear.

1−2

No relevant content

0

Indicative content

- part fill a measuring cylinder with water
- measure initial volume
- place object in water
- measure final volume
- volume of object = final volume − initial volume

- fill a displacement / eureka can with water
- water level with spout
- place object in water
- collect displaced water
- measuring cylinder used to determine volume of displaced water

(b) $density = \dfrac{48.6}{18.0}$

1

density = 2.70 (g/cm^3)

1

*an answer of 2.70 (g/cm^3) scores **2** marks*

(c) limestone

1

(d) eye position when using measuring cylinder
or
water level in can (at start) not at level of spout
or
not all water displaced by stone is collected in container

1

(e) volume would be lower / higher

1

[9]

4. (a) dependent

1

(b) (probe) C

allow 103.2

1

largest difference between reading and actual temperature

reason only scores if C chosen
accept larger
it is 3.2 greater is insufficient
comparing C with only one other probe is insufficient

1

(c) (i) 12(°C)

accept a value between 12.0 and 12.2 inclusive

1

(ii) 140 (seconds)

accept an answer between 130 and 150 inclusive

1

<u>temperature</u> starts to rise

only scores if time mark awarded
accept the <u>temperature</u> was lowest (at this time)

1

(iii) increase

accept faster (rate)

1

[7]

5. (a) chemical

1

kinetic

1

in this order only

(b) $E_k = 0.5 \times 80 \times 12^2$

1

$E_k = 5760$ (J)

1

*an answer of 5760 (J) scores **2** marks*

(c) $E = 0.040 \times 480 \times 50$

1

$E = 960$ (J)

1

*an answer of 960 (J) scores **2** marks*

(d)   increased

1

[7]