

Name of the Student: \_\_\_\_\_

Max. Marks : 19 Marks

Time : 19 Minutes

Mark Schemes

### Q1.

- (a) (i) temperature (increase) and time switched on are directly proportional  
*accept the idea of equal increases in time giving equal increases in temperature*

*answers such as:*

- *as time increases, temperature increases*
- *positive correlation*
- *linear relationship*
- *temperature and time are proportional*

*score 1 mark*

2

- (ii) any **one** from:

*"it" refers to the metal block*

- *energy transfer (from the block) to the surroundings*  
*accept lost for transfer*  
*accept air for surroundings*
- *(some) energy used to warm the heater / thermometer (itself)*  
*accept takes time for heater to warm up*
- *(metal) block is not insulated*

1

- (iii) 15 000

*allow 1 mark for correct substitution, ie  $50 \times 300$  provided no subsequent step shown*

2

- (b) lead

*reason only scores if lead is chosen*

1

*needs least energy to raise temperature by 1°C*

*accept needs less energy to heat it (by the same amount)*  
*lowest specific heat capacity is insufficient*

1

[7]

### Q2.

- (a) (i) Z

1

(ii) X

1

(b) (i) moving randomly

1

(ii) stronger than

1

(c) (i) evaporation

1

(ii) any **one** from:

- becomes windy
- temperature increases  
*accept (becomes) sunny*  
*"the sun" alone is insufficient*
- less humid

1

[6]

**Q3.**

(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]