

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

Max. Marks : 19 Marks

Time : 19 Minutes

Mark Schemes

**Q1.**

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| (a) (i) 120                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1 |
| (ii) 20<br><i>accept 140—their (a)(i) provided answer is not negative</i>                                                                                                                                                                                                                                                                                                                                                                                           | 1 |
| (iii) as speed increases                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1 |
| drag force / water resistance / friction / <b>D</b> increases                                                                                                                                                                                                                                                                                                                                                                                                       | 1 |
| (until) <b>D</b> = 140 N or (until) <b>D</b> = <b>T</b><br><i>forces balance is insufficient</i>                                                                                                                                                                                                                                                                                                                                                                    | 1 |
| (b) (i) (average) speed (of swimmer)                                                                                                                                                                                                                                                                                                                                                                                                                                | 1 |
| (ii) any <b>two</b> from:<br><ul style="list-style-type: none"> <li>• more data<br/><i>accept results for data</i><br/><i>do <b>not</b> accept more accurate data</i></li> <li>• force may vary (a lot) / change</li> <li>• give more <u>reliable average</u><br/><i>ignore references to anomalies</i><br/><i>ignore accurate / precise</i></li> </ul>                                                                                                             | 2 |
| (iii) examples of acceptable responses:<br><ul style="list-style-type: none"> <li>• most / some females produce smaller forces<br/><i>do <b>not</b> accept <u>all</u> females produce smaller forces</i></li> <li>• most / some males produce larger forces<br/><i>do <b>not</b> accept <u>all</u> males produce larger forces</i></li> <li>• some females swim as fast as males but use a smaller force</li> <li>• most of the faster swimmers are male</li> </ul> |   |

do **not** accept all males swim faster

- most of the slower swimmers are female  
do **not** accept all females swim slower
- range of the (average) speed of males is smaller than the range of the (average) speed of females
- range of the (average) force of the males is greater than the range of the (average) force of the females

1

- (iv) exert maximum (hand) force (throughout the swim / stroke)  
accept (any method to) increase (hand) force  
practise more is insufficient

1

[10]

## Q2.

- (a) (i) lorry  
reason only scores if lorry chosen

1

greatest mass  
accept weight for mass  
accept heaviest  
accept correct calculations for all 3 vehicles  
the biggest is insufficient

1

- (ii) 2450  
allow **1** mark for correct substitution  
ie  $175 \times 14$

2

- (b) (i) increases  
accept any clear indication of the correct answer

1

- (ii) speed increases  
accept velocity for speed  
accept gets faster  
do **not** accept it accelerates on its own  
moves more is insufficient

1

- (iii) straight line going to 6, 20  
allow **1** mark for a curve going to 6,20  
**or** a straight line diagonally upwards but missing 6,20

2

horizontal line from 6,20 to 8,20  
allow a horizontal line from where their **diagonal** meets 20m/s to 8,20

1

[9]