

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

**Max. Marks : 21 Marks**

**Time : 21 Minutes**

Mark Schemes

**Q1.**

- |   |             |
|---|-------------|
| (a) vectors have magnitude and direction          | 1           |
| (b) there is a resultant force acting on the ball | 1           |
| (c) length of lane = $4.5 \times 4.0$             | 1           |
| length of lane = 18 (m)                           | 1           |
| (d) arrow in opposite direction                   | 1           |
| arrow same length drawn from the ball             | 1           |
| (e)   |             |
| $a = \frac{12 - 0}{0.15}$                         | 1           |
| $a = 80 \text{ (m/s}^2\text{)}$                   | 1           |
| (f) increases                                     | 1           |
| stays the same                                    | 1           |
| increases   | 1           |
|   | <b>[11]</b> |

**Q2.**

- |   |   |
|---|---|
| (a) springs push the keys back to their original position | 1 |
| (b) so that the same force is needed to press each key    | 1 |
| (c) (the length) decreases                                |   |
| allow the spring compresses                               |   |

	1	
(d) 4.0 mm	1	
(e) the spring/key will not move far enough	1	
so will not press the (electrical contact) switch	1	
(f) $F = 200 \times 0.0040$	1	
$F = 0.80 \text{ (N)}$ <i>allow 0.8 (N)</i>	1	
(g) shorter spring	1	
spring with a lower spring constant <i>allow spring that requires less force to compress</i> <i>allow weaker spring</i> <i>allow spring that is easier to compress</i>	1	
		[10]