Question number	Answer	Notes	Marks
5 a	any FIVE from: MP1. Object has weight or there is a downward force (due to gravity on the object); MP2. So it accelerates (downwards); MP3. there is (a force of) drag (upwards or to oppose movement); MP4. drag increases as speed increases; MP5. eventually drag = weight ; MP6. (hence) resultant force is zero; MP7. (hence) object travels at constant speed;	allow: gravity pulls it down the speed/velocity increases oil resistance / water resistance / air resistance for drag oil friction / water friction / air friction for drag 'drag increases as it accelerates' forces are equal / forces are balanced accept 'no acceleration' DO NOT ALLOW • (The drag) slows it down MP2 • upthrust for drag MP3 • resistance = acceleration for MP5 • terminal velocity for constant speed for MP7	5

b	<u>Measuring instruments</u> MP1. Timer / stop-clock/ light gate (and data logger); MP2. Ruler / scale; <u>Measurements made</u> MP3. Take time for ball to pass between two points; MP4. determine the distance apart; MP5. Repeat readings lower down; **OR** MP6. For a set time (e.g. for 1 s); MP7. measure distance travelled (in this time); MP8. Repeat readings lower down; **OR** MP9. measure velocity using light gate with data logger; MP10. at two different places; <u>Using measurements</u> MP11. Use speed = distance / time; MP12. How results indicate terminal velocity achieved;	Ignore ticker-timer measurement of mass condone tape measure if the measurements are from top to bottom then only give MP3 or MP4 not both allow velocity for speed	5

(Total for Question 5 = 10 marks)