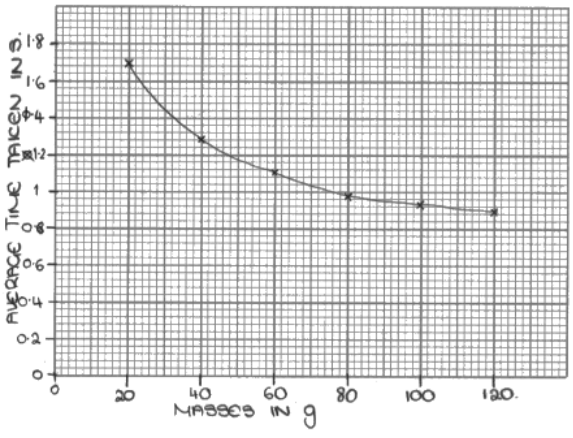
	MP6. idea that direction of current reverses (every half turn);	allow commutator switches current around	

Total for question 5 = 13 marks

Question number	Answer	Notes	Marks
6 (a)	use of stopwatch / stop clock; start timing when released and stop timing when parachute hits the floor;	allow use of datalogger condone timer	2
(b)	independent = mass (of parachute); dependent = time (taken for fall);		2
(c)	any one from: (constant) height; still air / no wind; release from rest; same area of parachute / same parachute;	however expressed	1
(d) (i)	correct average; given to 2 decimal places; e.g. 0.87666... 0.88	 mark independently	2
(ii)	suitable linear scale chosen (>50% of grid used); axes labelled with quantities and unit; plotting correct to nearest half square (minus one for each plotting error) ;;  	ignore orientation **ignore final point** i.e. two plotting errors = no marks for plotting **mass in g** / **average time taken in s** 20 / 1.68 40 / 1.26 60 / 1.11 80 / 0.99 100 / 0.93 120 / 0.88	4

	(iii)	acceptable curve of best fit drawn;	i.e. smooth curve with even distribution of points either side allow ecf from plotting errors ignore parts of curve outside plotted points if extrapolated	1
(e)	(i)	down arrow labelled weight; up arrow labelled air resistance / drag;	allow gravitational force ignore 'gravity' allow friction ignore lift, upthrust	2
	(ii)	any three from: MP1. idea of unbalanced force at the start (which causes acceleration); MP2. air resistance increases with speed; MP3. idea of forces become balanced; MP4. (therefore) no resultant force (near the bottom);	e.g. only weight is acting e.g. weight is equal to air resistance	3

Total for question 6 = 17 marks