Question number	Answer	Notes	Marks
12 (a)	A – arrangement W; B cannot be correct as arrangement X would give a downwards force C and D cannot be correct because at the position of the wire, the magnetic field is zero, so there cannot be a magnetic force on the wire		1
(b) (i)	substitution into "W = mg"; evaluation; e.g. W = 0.0065 × 10 W = 65 (mN)	ignore POT for this mark accept use of g = 9.8(1) m/s^2 giving 63.7 or 63.8 (mN)	2
(ii)	resultant force is difference between weight and magnetic force; resultant force = 31 mN; substitution in "F=ma"; re-arrangement; evaluation; e.g. resultant force = 65 – 34 = 31 mN resultant force = 31 × 10^{-3} = 6.5 × 10^{-3} × a a = 31 × 10^{-3} / 6.5 × 10^{-3} a = 4.8 (m/s^2)	 allow ecf from (b)(i) POT error gives 1 mark penalty 5.2(3) scores 3 MAX (no evidence of resultant idea) allow 4.76(9) (m/s^2) use of g = 9.81 m/s^2 gives 4.57 (m/s^2)	5
(iii)	EITHER • increase the current; • by increasing the voltage of power supply; OR • increase the magnetic field strength; • by using stronger magnets/moving the poles closer together;	 ignore unqualified reference to increasing the turns/creating a coil	2
(iv)	use a.c. rather than d.c.; since a.c. current has alternating/changing current direction;		2

Total for Question 12 = 12 marks