Question Number	Answer	Mark
18(a)	• (Rotating coil in field causes) changing (magnetic) flux linkage with coil **(1)** **Or** wires/coils cut lines of (magnetic) flux **(1)** • <u>E.m.f.</u> <u>induced</u> **(1)** • Complete circuit, so current in circuit • p.d./current produced changes in direction (as opposite parts of the coil switch sides), so LED only shines when current is flowing in one direction **(1)**	**(4)**
18(b)(i)	• Period doubled **(1)** • Amplitude halved **(1)**	**(2)**
18(b)(ii)	• (Half angular velocity) so takes twice as long to turn so period doubled **(1)** • (Half angular velocity) so rate of change of flux halved so e.m.f halved **(1)**	**(2)**
18(b)(iii)	• Use of $\varphi = BA$ **(1)** • Period (from graph) = 0.2 s **(1)** • Use of $\varepsilon = N\,\mathrm{d}\varphi / \mathrm{d}t$ **(1)** • $N = 400$ turns **(1)** <u>Example of calculation</u> 3.2 V = $N \times 0.083$ T $\times 0.0048$ m^2 / 0.25×0.2 s $N = 402$	**(4)**
	Total for question 18	**12**