| Question Number | Answer | | Mark |
|---|---|---|---|
| **18a** | Flux linkage | (1) | **2** |
| | weber / Wb | (1) | |
| **18b** | Evidence of attempt to determine maximum gradient of graph | (1) | **6** |
| | Use of $\Delta B / \Delta t$ | (1) | |
| | use of area of coil = $\pi r^2$ | (1) | |
| | use of $\emptyset = BA$ | (1) | |
| | Use of $\varepsilon = \frac{d(N\emptyset)}{dt}$ | (1) | |
| | $\mathcal{E}$ = 1.4 V range 1.2 to 1.6 V | (1) | |
| | <u>Example of calculation</u> | | |
| | gradient = 0.6 T / 0.006 s = 100 T $s^{-1}$ | | |
| | Area of coil $= \pi(0.003\ \mathrm{m})^2 = 2.83 \times 10^{-5}\ \mathrm{m}^2$ | | |
| | $\varepsilon = 500 \times 100\ \mathrm{T\,s}^{-1} \times 2.83 \times 10^{-5}\ \mathrm{m}^2$ | | |
| | $\mathcal{E}$ = 1.4 V | | |
| **18c** | There is a change in the magnetic flux (linkage with aluminium disc)<br>**Or** disc is cutting magnetic field/flux | (1) | **6** |
| | So an <u>e.m.f.</u> is <u>induced</u> | (1) | |
| | Leads to a current (in the disc) (accept eddy current) | (1) | |
| | Force acts on the disc, as there is a current in a magnetic field (accept reference to motor effect, FLHR or $F = BIl$ if current in disc has been mentioned)<br>**Or** field due to current in disc interacting with field due to magnet to cause force on disc | (1) | |
| | According to Lenz's law<br>**Or** the direction of e.m.f./current is such to oppose (the cause of) the change in flux | (1) | |
| | The disc moves to reduce this change (the same direction as the magnet) so correct suggestion | (1) | |
| | **Total for question 18** | | **14** |