

**Mark scheme for Support Worksheet – Topic 5,
Worksheet 6**

- 1** Magnetic flux through a loop is the product of the magnetic field at the position of the loop times the area of the loop times the cosine of the angle between the field and the normal to the loop; magnetic flux linkage is the product of the magnetic flux times the number of turns of wire around the loop. [2]
- 2** The induced emf in a loop; is equal to the rate of change of the magnetic flux linkage through the loop. [2]
- 3** $E = \frac{\Delta\Phi}{\Delta t} = \frac{0.60 - 0.25}{0.80}$; $E = 0.44 \text{ V}$ [2]
- 4** The alternating current produces a magnetic field that is changing; hence the magnetic flux in the loop also changes producing an emf. [2]
- 5 a** At time zero. [1]
- b** $E = \frac{\Delta\Phi}{\Delta t}$; $E = \frac{10 - 80}{2.0} = -35 \text{ V}$ [2]