Warm up set 10

Question

1. HRW6 31.TB.02. [120186] Suppose this page is perpendicular to a uniform magnetic field and the magnetic flux through it is 5 Wb. If the page is turned by 30° around an edge the flux through it will be:
   (a) 4.3 Wb
   (b) 10 Wb
   (c) 5.8 Wb
   (d) 2.5 Wb
   (e) 5 Wb

Answer:

(a) 4.3Wb

Flux is only the component of the penetrating magnetic field that is perpendicular to the surface.

$$\Phi = 5Wb \cdot \cos 30° = 4.3Wb$$

Question

2. HRW6 31.TB.08. [120192] Faraday's law states that an induced emf is proportional to:
   (a) the rate of change of the electric field
   (b) the rate of change of the magnetic field
   (c) zero
   (d) the rate of change of the magnetic flux
   (e) the rate of change of the electric flux

Answer:

(d) The rate of change of the magnetic flux

Faraday's Law States:

$$Emf = -\frac{d\Phi_m}{dt}$$

Question

3. HRW6 31.TB.09. [120193] The emf that appears in Faraday's law is:
   (a) around a conducting circuit
   (b) perpendicular to the surface used to compute the magnetic flux
   (c) throughout the surface used to compute the magnetic flux
   (d) none of these
   (e) around the boundary of the surface used to compute the magnetic flux

Answer:
(e) Around the boundary of the surface used to compute the magnetic flux

A changing magnetic flux induces an emf in a loop around the area through the flux has varied. This loop can be of any material, although a current may or may not flow depending on the conductivity of the material