Answers Test 3 2016

1. Point ①

$$\vec{B} = [B_{1x} + B_{2x}]\,\vec{i}_x + [B_{1y} + B_{2y}]\,\vec{i}_y$$

$$\vec{B}_1 = \frac{\mu_0 i_1}{2\pi\sqrt{S^2+H^2}}\left[-\sin\theta\,\vec{i}_x + \cos\theta\,\vec{i}_y\right]$$

$$\vec{B}_2 = \frac{\mu_0 i_2}{2\pi\sqrt{S^2+H^2}}\left[\sin\theta\,\vec{i}_x + \cos\theta\,\vec{i}_y\right]$$

$$\cos\theta = \frac{S}{r}\,;\quad \sin\theta = \frac{H}{r}\,;\quad r = \sqrt{S^2+H^2}$$

Point ②

$$\vec{B} = \left(\frac{\mu_0 i_1}{2\pi\left(2S+\frac{D}{2}\right)} - \frac{\mu_0 i_2}{4\pi D}\right)\vec{i}_y$$

2. $\vec{B}_{BC} = \frac{\mu_0 i}{4\pi R}(\pi - \theta)\otimes$

3. $Q(t) = C\,\frac{\mu_0 i}{2\pi}\,\alpha t \ln\frac{D+W}{D}$

$d\vec{F}_{mag} = i\,d\vec{s}\times\vec{B}$ to the left

4. $Q(t) = C B_0 H W \gamma\left(1 - e^{-\frac{t}{RC}}\right)$