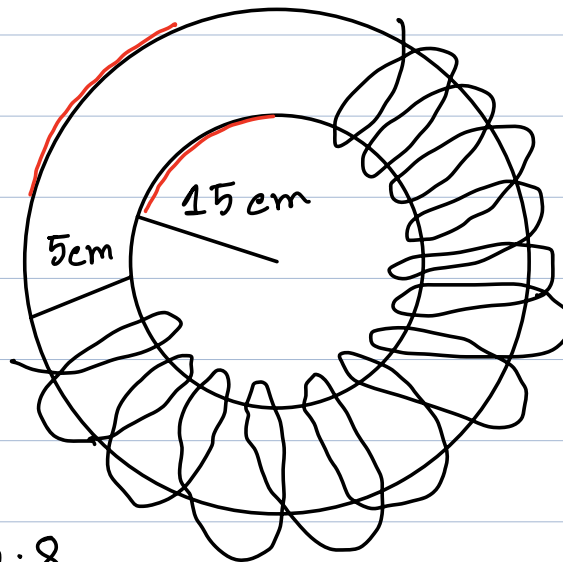


Chapter - 29

7, 8, 10, 15, 43, 49 → 52

49.



$$i = 0.8$$

$$N = 500$$

$$a) \quad B_{in} = \frac{\mu_0 N i}{2\pi r}$$

$$B_{in} = \frac{4\pi \times 10^{-7} \times 500 \times 0.8}{2\pi \times (15 \times 10^{-2})}$$

$$B_{out} = \frac{4\pi \times 10^{-7} \times 500 \times 0.8}{2\pi \times (20 \times 10^{-2})}$$

50. $L = 0.95 \text{ m}$

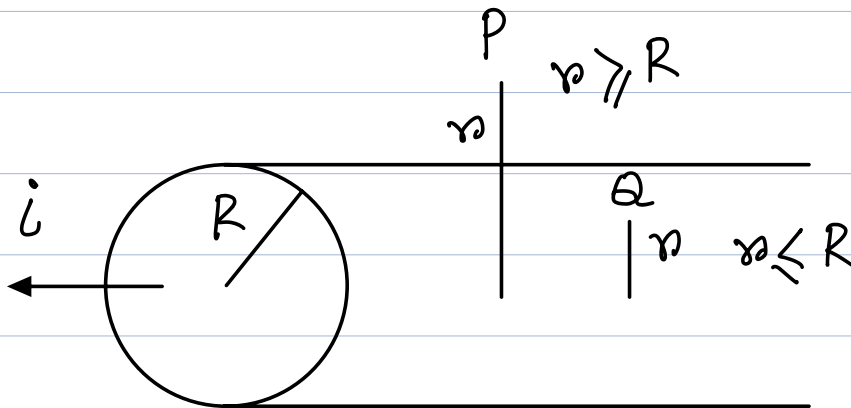
$$N = 1200$$

$$i = 3.6$$

$$B = \frac{\mu_0 N i}{L}$$

$$= \frac{4\pi \times 10^{-7} \times 1200 \times 3.6}{0.05}$$

43.



$$B = \frac{\mu_0 i r}{2\pi R^2} \quad r \leq R$$

$$B = \frac{\mu_0 i}{2\pi r} \quad r > R$$

$$a) \quad B = \frac{\mu_0 \cdot 0 \cdot r}{2\pi R^2} = 0$$

$$b) \ r < R \quad B = \frac{\mu_0 i (1 \times 10^{-2})}{2\pi \times (2 \times 10^{-2})}$$

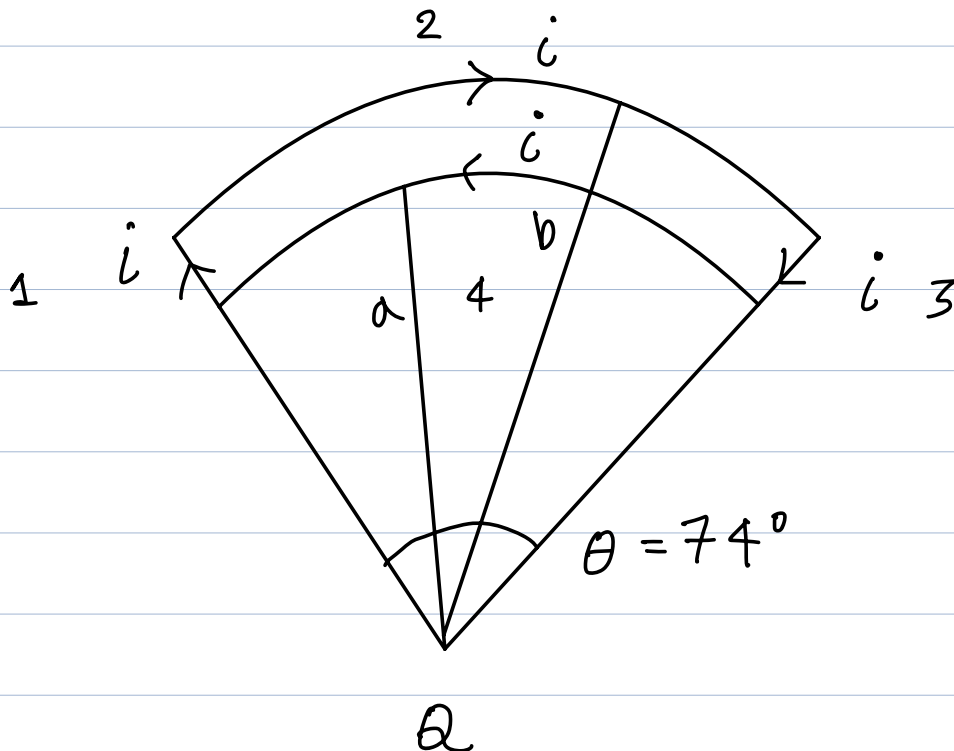
$$c) \ r = 2 \ ; \ r = R$$

$$B = \frac{\mu_0 i}{2\pi (2 \times 10^{-2})}$$

$$d) \ r = 4 \ ; \ r > R$$

$$B = \frac{\mu_0 i}{2\pi (4 \times 10^{-2})}$$

7.



$$B = \int \frac{\mu_0}{4\pi} \frac{i d\vec{s} \times \hat{r}}{r^2}$$

$$i) B = 0$$

$$ii) B = \int \frac{\mu_0}{4\pi} \frac{i ds |\hat{r}| \sin 90^\circ}{r^2}$$

$$= \int \frac{\mu_0}{4\pi} \frac{i ds}{r^2}$$

$$= \int \frac{\mu_0}{4\pi} \frac{i r d\theta}{r^2}$$

$$= \int \frac{\mu_0 i}{4\pi r} d\theta$$

$$= \frac{\mu_0 i}{4\pi r} \int_0^\theta d\theta$$

$$= \frac{\mu_0 i}{4\pi r} \theta$$

$$B_2 = \frac{\mu_0 i}{4\pi a} \left(\frac{74}{180} \pi \right) (-\hat{k})$$

[inside the plane]

$$B_3 = 0$$

$$B_4 = \frac{\mu_0 i}{4\pi b} \left(\frac{74}{180} \pi \right) (\hat{k})$$

$$\vec{B} = \vec{B}_2 + \vec{B}_4$$

10. Try this at home.

15. Try this at home.