1. Sketch direction of magnetic field around both side of wires (use ○ (out of plane), □ (inside plane)): [4pt]

(i) 

![Circle diagram]

(ii) 

![Line diagram]

To answer the following question you need to read lab manual.

2. Indicate the positive direction of Axial and radial field for the below magnetic sensor: [2pt]
3. In the following picture, we have two wires that carry current $I$ and $2I$ respectively for wire 1 and wire 2. (Use $B = \frac{\mu_0 I}{2\pi R}$) [4pt] (show the work for part a, b, c for full credit).

![Diagram of two wires with current](image)

a) Find magnitude of magnetic field for wire 1 at point P ($B_1$) in terms of $\frac{\mu_0 I}{2\pi d}$

b) Find magnitude of magnetic field for wire 2 at point P ($B_2$) in terms of $\frac{\mu_0 I}{2\pi d}$

c) Find **numeric value** for magnitude of magnetic field due to both wires $B_{total}$ (Assume that $\frac{\mu_0 I}{2\pi d} = 0.1 \, T$)

d) What is the direction of magnetic field at point P(circle one of the following options):
   - (i) Out of plane
   - (ii) Inside plane
   - (iii) Total magnetic field at point P is zero, thus there is no direction.