№ 7.1.1

$$R = \frac{\rho \cdot l}{A} = \frac{0.0175 \cdot 4.5}{2.5} = 0.0315 \ \Omega$$

$$I = \frac{U}{R} = \frac{12}{0.0315} = \underline{\underline{380.95 \ A}}$$

№ 7.1.2.

$$R = \frac{\rho \cdot l}{A} = \frac{0.0175 \cdot 3.2}{2.5} = 0.0224 \ \Omega$$

$$U = R \cdot I = 0.37 \cdot 15 = 5.55 \ V$$

$$U_{ch} = R_l \cdot I = 0.0224 \cdot 15 = 0.336 \ V$$

$$U_{battr.} = U + U_{ch} = 5.55 + 0.336 = 5.886 \ V$$

$$I_{c/c} = \frac{U}{R} = \frac{5.886}{0.0224} = \underline{\underline{262.76 \ A}}$$

№ 7.1.3

$$R = \frac{\rho \cdot l}{A} = \frac{0.0175 \cdot 2.6}{35} = 0.0013 \ \Omega$$

$$R_t = R_i + R_l + R = 0.008 + 0.0013 + 0.00327 = 0.01257 \ \Omega$$

$$I = \frac{E}{R_t} = \frac{12}{0.01257} = \underline{\underline{954.66 \ A}}$$

№ 7.1.4

$$a: \quad I_{c/c} = \frac{E}{R_i} = \frac{12}{0.0184} = \underline{\underline{652.2 \ A}}$$

$$b: \quad R = \frac{\rho \cdot l}{A} = \frac{0.0175 \cdot 3.6}{1.5} = 0.042 \ \Omega$$

$$R_t = R + R_i = 0.042 + 0.0184 = 0.0604 \ \Omega$$

$$I = \frac{E}{R_t} = \frac{12}{0.0604} = \underline{\underline{198.7 \ A}}$$

Nº 7.1.5

$$R = \frac{E}{I\%} = \frac{4,5}{1,6} = \underline{\underline{2,81 \ \Omega}}$$

Nº 7.1.6

$$I\% = \frac{E}{Ri} = \frac{42}{0,056} = 750 \ A$$

$$A = \phi^2 \cdot 0,785 = 2^2 \cdot 0,785 = 3,14 \ mm^2$$

$$R = \frac{\varphi \cdot l}{A} = \frac{0,0175 \cdot 1.2}{3,14} = 0,0066 \ \Omega$$

$$Rt = Ri + R = 0,056 + 0,0066 = 0,0626 \ \Omega$$

$$I = \frac{E}{Rt} = \frac{42}{0,0626} = \underline{\underline{670 \ A}}$$

Nº 7.1.7.

a: $Rt = Ri + Rl + R = 0,06 + 4,2 + 80 = 84,26 \ \Omega$

$$I = \frac{E}{Rt} = \frac{110}{84,26} = \underline{\underline{1,305 \ A}}$$

b: $Rt = Ri + Rl = 0,06 + 4,2 = 4,26 \ \Omega$

$$I = \frac{E}{Rt} = \frac{110}{4,26} = \underline{\underline{25,82 \ A}}$$

c: $Rt = Ri + 3/4 \ de \ Rl = 0,06 + \left(\frac{4,2 \cdot 3}{4}\right) = 3,21 \ \Omega$

$$I = \frac{E}{Rt} = \frac{110}{3,21} = \underline{\underline{34,26 \ A}}$$

D: $Rt = Ri + \frac{1}{2} \ de \ Rl = 0,06 + \left(\frac{4,2 \cdot 1}{2}\right) = 2,16 \ \Omega$

$$I = \frac{E}{Rt} = \frac{110}{2,16} = \underline{\underline{50,92 \ A}}$$

E: $Rt = Ri + \frac{1}{4} \ de \ Rl = 0,06 + \left(\frac{4,2 \cdot 1}{4}\right) = 1,11 \ \Omega$

$$I = \frac{E}{Rt} = \frac{110}{1,11} = \underline{\underline{99,09 \ A}}$$

F: $Rt = Ri = 0,06 \ \Omega$

$$I = \frac{E}{Ri} = \frac{110}{0,06} = \underline{\underline{1833,5 \ A}}$$

№ 7.2.1

$$R = \frac{\varphi \cdot l}{A} \cdot 2 = \frac{0,0175 \cdot 190}{1.5} \cdot 2 = 4,43 \ \Omega$$

$$I\% = \frac{U}{R} = \frac{225}{4,43} = \underline{50,75 A}$$

№ 7.2.2

$$R = \frac{\varphi \cdot l}{A} \cdot 2 = \frac{0,0175 \cdot 14}{2,5} \cdot 2 = 0,196 \ \Omega$$

$$a: \quad I\% = \frac{U}{R} = \frac{190}{0,196} = \underline{969,38 \ A}$$

$$Rt = Rl + R = 0,196 + 0,1 = 0,296$$

$$I\% = \frac{U}{R} = \frac{190}{0,296} = \underline{641,89 \ A}$$

№ 7.2.3

$$R = \frac{\varphi \cdot l}{A} \cdot 2 = \frac{0,0175 \cdot 35}{4} \cdot 2 = 0,306 \ \Omega$$

$$U = U - 8\% = \frac{220 \cdot 92}{100} = 202,4 \ V$$

$$I\% = \frac{U}{R} = \frac{202,4}{0,306} = \underline{661,43 \ A}$$

Nº 7.3.1

$$R = \frac{\varphi \cdot \ell}{A} \cdot 2 = \frac{0,0175 \cdot 42,5}{6} \cdot 2 = 0,248 \ \Omega$$

a: $\quad I_{c/c} = \frac{U}{R} = \frac{190}{0,248} = \underline{\underline{766,12 \ A}}$

b: $\quad I_{c/c} = \frac{U}{R} = \frac{110}{0,248} = \underline{\underline{443,54 \ A}}$

Nº 7.3.2

$$R = \frac{\varphi \cdot \ell}{A} \cdot 1.732 = \frac{0,0175 \cdot 2400}{25} \cdot 1,732 = 2,909 \ \Omega$$

$$I = \frac{U}{R} = \frac{6000}{2,909} = \underline{\underline{2062,56 \ A}}$$

$$P = R \cdot I^2 \cdot \sqrt{3} = 2,909 \cdot 2062,56^2 \cdot 1.732 = \underline{\underline{21,43 \ MVA}}$$

Nº 7.3.3

$$R_1 = \frac{\varphi \cdot \ell}{A} \cdot \sqrt{3} = \frac{0,0175 \cdot 40}{70} \cdot 1,73 = 0,0173 \ \Omega$$

$$R_2 = \frac{\varphi \cdot \ell}{A} \cdot \sqrt{3} = \frac{0,0175 \cdot 64}{35} \cdot 1,73 = 0,0554 \ \Omega$$

$$R_3 = \frac{\varphi \cdot \ell}{A} \cdot \sqrt{3} = \frac{0,0175 \cdot 146}{16} \cdot 1,73 = 0,2765 \ \Omega$$

$$R_t = R_1 + R_2 + R_3 = 0,0173 + 0,0554 + 0,2765 = 0,349 \ \Omega$$

$$U = \frac{380 \cdot 70}{100} = 266 \ V$$

$$I_{c/c} = \frac{U}{R} = \frac{226}{0,349} = \underline{\underline{762,17 \ A}}$$

Nº 7.3.4

$$A = \phi^2 \cdot 0,785 = 5^2 \cdot 0,785 = 19,625 \ mm^2$$

$$R = \frac{\varphi \cdot \ell}{A} \cdot \sqrt{3} = \frac{0,0175 \cdot 250}{19,625} \cdot 1,73 = 0,386 \ \Omega$$

$$U = 40\% \ de \ U = \frac{500 \cdot 40}{100} = 200 \ V$$

$$I_{c/c} = \frac{U}{R} = \frac{200}{0,386} = \underline{\underline{518,13 \ A}}$$