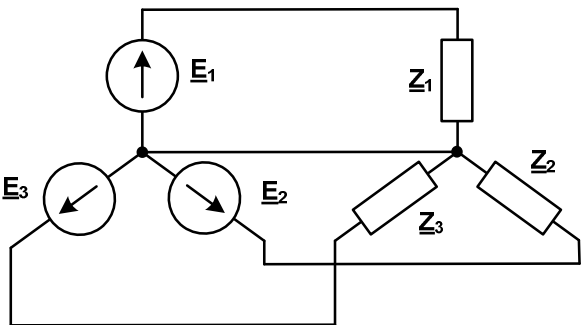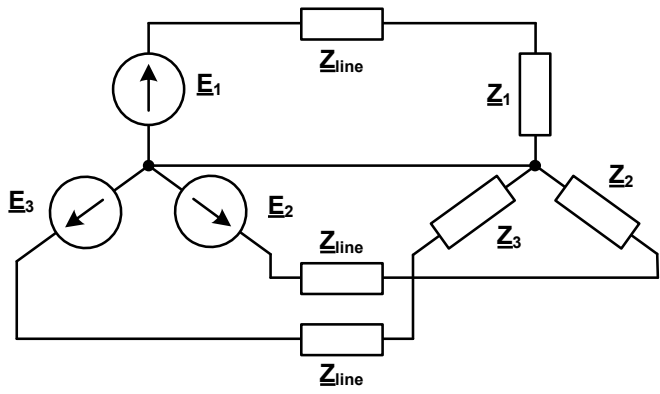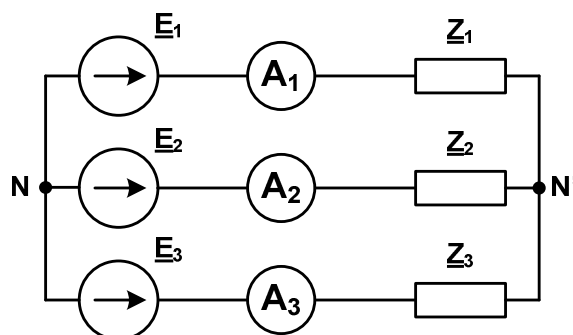## ELECTRICAL CIRCUITS 2 (IS-FEE-10085S) - TEST 2 (EXAMPLE)

PROBLEM TO BE SOLVED IN A GROUP	Points
1. In a 3-phase unbalanced Y-Y system, the source voltage is E_{ph} = 230 V rms. The impedances of a load are: $\underline{Z}_1$ = (25+j25) Ω, $\underline{Z}_2$ = (20-j10) Ω, $\underline{Z}_3$ = (10+j20) Ω. Calculate by what percentage the total active power of the load will change if we take into account the impedance of the power lines. $\underline{Z}_{line}$ = (1+j1) Ω. System without impedance in the power lines System with impedance in the power lines 	10

PROBLEMS TO BE SOLVED INDIVIDUALLY	Points
2. A balanced 3-phase distribution line is used to supply four balanced Y-loads that are connected in parallel: Load 1: 15 kVA at 0.97 pf, leading Load 3: 10 kW and 5 kVAr Load 2: 18 kVA at 0.9 pf, lagging Load 4: 12kW at unity pf. The line voltage at the load is 400 V rms. Find the line current in the distribution line and the combined power factor (pf) at the load.	10
3. In a 3-phase unbalanced Y-Y system, the source voltage is E_{ph} = 200 V rms. The impedances are: $\underline{Z}_1$ = (20+j40) Ω, $\underline{Z}_2$ = (40-j40) Ω, $\underline{Z}_3$ = (40+j20) Ω. Calculate the readings of ammeters and draw a phasor diagram of currents and voltages. 	15

Note: 18 points are required to pass the test.