List of topics for oral part of the exam from

Transport Properties in Solid State (UFV/TRANS/18)

1) Drude model; rate of change of crystal momentum in an electric field; length scales and transport classification
2) Boltzmann transport mechanism; Boltzmann equation
3) Impurity scattering and relaxation time; tensor of electrical conductivity
4) Thermal transport; electric and heat currents; transport coefficients
5) Magnetotransport; Hall effect
6) Classical point contact; Sharvin resistance
7) Electric transverse modes; magnetoelectric modes; Landau levels
8) Landauer formalism; quantum conductance
9) Landauer–Büttiker formalism; Onsager relations and reciprocity relations
10) Integer quantum Hall effect
11) Scattering theory; S-matrix and its properties
12) Tunneling phenomena; transfer matrix formalism; resonant scattering
13) Coulomb blockade