

Handwritten notes are allowed in the exam. The maximum score is 10 points. Answer all questions.

1 Glossary (4p)

Define the following terms and concepts (a 0.5 p).

- (a) vacancy
- (b) edge dislocation
- (c) polarizability
- (d) ferroelectricity
- (e) Lorentz oscillator model of dielectricity
- (f) superconducting gap
- (g) Meissner effect
- (h) Josephson DC effect

2 Questions (6p)

Answer the following questions (a 2 p).

- (a) What kinds of materials properties can defects affect, and how?
- (b) How and why does the dielectric constant depend on the frequency of the electric field?
- (c) What are the characteristic properties of type I and type II superconductors?