

Please answer either in English or Finnish.

1. Explain briefly (max. 2 pages altogether, draw schematics if needed):
 - a) extreme ultraviolet (EUV) lithography
 - b) biolabeling
 - c) break-junction technique in molecular electronics
 - d) nanocomposites
 - e) principle of a read head of magnetic disk drive (GMR effect)
 - f) superhydrophobic surfaces(each 1 p)

2. Nanoimprint lithography and comparison to other nanolithography techniques. (6 p)

3. Carbon nanotubes
 - a) structural and electronic properties (3 p)
 - b) characterization of their structure (3 p)

4. a) Atomic layer deposition (ALD). (3 p)
b) Explain origin of fluorescence color in semiconductor quantum dots. (3 p)

5. a) Structure and basic operation principle of a single electron transistor (SET). (3 p)
b) Applications of graphene. (3 p)