

## **AS-74.3136 Introduction to Microsystems**

Exam, 02.09.2013

- **No Books are allowed in the exam.**
- **Non-programmable scientific calculators are allowed.**

Please answer the questions below. The answer of each (sub-)question should be brief (3-5 sentences) if not otherwise indicated. Each question is worth 6 points. 15 points minimum to pass the exam.

1. What are microsystems? Please also give three examples of application of microsystems (1-2 sentences each).
2. What is microfabrication? Please describe the major steps with graphical illustration.
3. What are the scaling laws of electrostatic forces and capillary force? Please derive based on first principles.
4. Describe two designs of piezoelectric actuator with graphical illustrations (one linear actuator, one motor).
5. What is microsensors? Please give two examples of microsensors with graphical illustrations (one mechanical, one chemical).