Department of information technology and media
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Sensor devices
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Study questions for the exam in Sensor devices

Instuderingsfrågor inför tentamen i Sensorkomponenter

Basic part

1 Why is silicon dioxide so important in fabrication of silicon detectors?
2 Describe the planar technology.
3 How do you terminate dangling bonds in a silicon surface?
4 Why is the immobilization of the biological element in a biosensor important?
5 Describe different types of immobilization schemes for biosensors?
6 What are the two main functions of biosensor packaging?
7 Which processing technology is mostly used in fabrication of sensor devices?
8 What is the advantages using batch processing?
9 In lithographical processing equipment, the wavelength of exposure light has a tendency to decrease during the year. Why is it so? Advantage and disadvantage!
10 The Anisotropic etching of silicon can be controlled by means of depth by four different methods. Which methods?
11 In fabrication of thermal detectors, thin membranes are often used. Why?
12 Why is it necessary to heat up a gaseous detector of type tin-oxide?
13 To measure stress in a mechanical sensor, where should the resistor be placed?
14 What physical properties are measured in an acoustic sensor?
15 You have two types of magnetic sensors, one hall sensor and one magneto resistive sensor, how should you mount them for maximum sensitivity?
16 What property must the crystal have in an acoustic sensor?
17 Describe how piezo-resistivity can be used to measure physical properties.
18 What type of processes are involved in the heat transfer in a thermal detectors?
19 Why do you (normally) need a rectifying contact in manufacturing of silicon detectors for ionization radiation?
20 The anisotropic wet-etching of silicon needs an etching mask. Which type of etching masks can be used for most types of etching solutions? What is the reason for sloped walls (54.74°) when etching 100 silicon?
21 What is the use of an enzyme in a biosensor?
22 Describe IV and CV measurements of semiconductor sensor samples.
23 Describe the conversion in a thermal detector? What types of losses are involved?
24 What is the use of a catalyst/promoter in a chemical sensor?
25 You would like to measure ultra violet light with a wavelength of 0.2 um. The detector should also be “solar blind”. What type of semiconductor can be used? Bandgap? Example of semiconductor?