

Unit 7 - Application of Fabrication Technology

Course outline

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Introduction

Introduction to MEMS-based Sensors

Fundamentals of Fabrication Techniques

Fundamentals of Fabrication Techniques contd...

Fundamentals of Fabrication Techniques contd...

Application of Fabrication Technology

Typical Microfabricated Devices for Biomedical Applications

Cancer Diagnostic Tool

Process Flow for Fabrication of Micro Heater

Solution: Week 5 Assignment

Quiz : Week 5 Assessment

Fabrication of Sensors for Cancer Diagnosis

Fabrication of a Device to Determine Efficacy of Drugs

Fabrication of Microchip for Rapid Drug Screening

Fabrication of a Smart Catheter

Lab: Introduction to Cleanroom and Cleanroom Equipments

Lab: Introduction to Equipments in Cleanroom

Lab: Cleanroom Equipments and Demonstration

Text Transcripts

Week 5 Assessment

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-09-04, 23:59 IST.

Week 5 Assignment

1) Microheater is very important device for biomedical applications. What are the advantages of fabricating on-chip microheater over separate supply for maintaining a constant temperature? **1 point**

- Low power consumption
- Provides high temperature at relatively low power
- Fast response
- All of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of these

2) After purchasing new wafers from foundry, it is advisable to clean the wafers before fabricating devices on that. There are few standard cleaning processes. Which of the following is one of the processes to clean the wafers? **1 point**

- RCA cleaning
- Acetone dip
- IPA dip
- All of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
RCA cleaning

3) Cancer in human body is classified based on its origin. Carcinoma is a cancer involving _____ of human body. **1 point**

- Embryonic tissue
- Connective tissue
- Epithelial tissue
- Nervous tissue

No, the answer is incorrect.
Score: 0

Accepted Answers:
Epithelial tissue

4) After fabrication of a microheater on silicon wafer, sometimes the wafer is etched to a diaphragm structure. What is the advantage of having a diaphragm structure in the micro heater? **1 point**

- Low power consumption
- Improved mechanical stability
- No significant effect
- High resistance

No, the answer is incorrect.
Score: 0

Accepted Answers:
Low power consumption

5) Two Si wafers can be bonded to each other for fabrication of a cavity using _____ bonding technique. **1 point**

- Plasma bonding
- Direct bonding
- Epoxy bonding
- Adhesive bonding

No, the answer is incorrect.
Score: 0

Accepted Answers:
Direct bonding

6) Which of the following statement is true? **1 point**

- The wet etching of (110) planes of Si wafer exhibits slower rate than (100) and (111) planes
- The wet etching of (111) planes of Si wafer exhibits slower rate than (110) and (100) planes
- The wet etching of (100) planes of Si wafer exhibits slower rate than (110) and (111) planes
- None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
The wet etching of (111) planes of Si wafer exhibits slower rate than (110) and (100) planes

7) Which of the following is a good prognostic factor in detecting breast cancer? **1 point**

- Tumour Grade III
- Lymphatic and vascular invasion
- Tumour size
- ER positivity

No, the answer is incorrect.
Score: 0

Accepted Answers:
ER positivity

8) What is the material used for a microheater? **1 point**

- Gold
- Copper
- Nichrome
- Aluminium

No, the answer is incorrect.
Score: 0

Accepted Answers:
Nichrome

9) Microheaters are one of the most important part of a VOC sensor. Usually an insulating layer of SiO₂ is deposited on microheater **1 point**

- To reduce the temperature at the surface of the insulator where the heat will be used
- To provide uniform heating owing to thermal insulation property of SiO₂
- To stop the heat from spreading from the microheater layer to the other surfaces
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
To provide uniform heating owing to thermal insulation property of SiO₂

10) Which of the following statements are false? **1 point**

- DRIE provides a large aspect-ratio etching capability
- DRIE etches in multiple directions within the substrate
- DRIE enables faster etch rates and the formation of deep etch structures
- DRIE uses chemicals to etch out surfaces

No, the answer is incorrect.
Score: 0

Accepted Answers:
DRIE etches in multiple directions within the substrate

11) Which of the following statement is false? **1 point**

- Acetone is generally used for photoresist stripping
- Xylene can remove negative photoresists from the samples
- Piranha cleaning is often used to remove coated photoresist layer
- At 110°C - 120°C acetone strips photoresists more efficiently, so, this recipe is recommended for photoresist stripping

No, the answer is incorrect.
Score: 0

Accepted Answers:
At 110°C - 120°C acetone strips photoresists more efficiently, so, this recipe is recommended for photoresist stripping

12) Which of the following statement is false? **1 point**

- In PECVD chamber silane and oxygen reacts in presence of nitrogen to form silicon dioxide
- Silicon, germanium, silicon dioxide, silicon nitride can be deposited by PECVD process
- DRIE process consists of cycles of etching of the substrate and removal of by-products.
- RIE-Cl can etch silicon, silicon dioxide and silicon nitride.

No, the answer is incorrect.
Score: 0

Accepted Answers:
In PECVD chamber silane and oxygen reacts in presence of nitrogen to form silicon dioxide