Unit 4 - Fundamentals of Fabrication Techniques

Week 2 Assessment

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

Due on 2019-08-21, 23:59 IST.

1) _____ process can produce silicon wafer with more purity than other processes. *1 point*

- Czochralski technique
- Float Zone technique
- Cast of molten silicon
- None of these

No, the answer is incorrect.
Score: 0
Accepted Answers:
Float Zone technique

2) From the primary and secondary (if present) flat of a silicon wafer indicates: *1 point*

I. Crystal orientation
II. Doping concentration
III. Dopant type
IV. Wafer production technique

- I, II
- I, III
- I, III, IV
- I, II, III

No, the answer is incorrect.
Score: 0
Accepted Answers:
I, III

3) In e-beam evaporation technique, the current density leaving the filament is given by _____. *1 point*

- Gauss's equation
- Maxwell's equation
- Richardson's equation
- Faraday's law

No, the answer is incorrect.
Score: 0
Accepted Answers:
Richardson's equation

4) Which of the statement is correct for HMDS? *1 point*

- It is used before photoresist coating to increase adhesion of photoresist
- HMDS layer is generally very thick compared to photoresist
- It is an etchant that increase roughness of the substrate surface, increasing adhesion of photoresist
- It is used to change the optical property of photoresist so that photoresist can be exposed using light of another wavelength

No, the answer is incorrect.
Score: 0
Accepted Answers:
It is used before photoresist coating to increase adhesion of photoresist

5) At same vacuum level, which of the following PVD technique can deposit film with better purity? *1 point*

- Sputtering
- Thermal evaporation
- Spin coating
- E-beam evaporation

No, the answer is incorrect.
Score: 0
Accepted Answers:
E-beam evaporation

6) Oxide layer of 750nm is grown on silicon wafer by dry oxidation and wet oxidation. Thickness of silicon wafer consumed in dry oxidation and wet oxidation are: *1 point*

- 115nm, 115nm
- 345nm, 345nm
- 115nm, 345nm
- 345nm, 115nm

No, the answer is incorrect.
Score: 0
Accepted Answers:
345nm, 345nm

7) You want to fabricate micro-heater structures and insulate it by silicon dioxide layer. Only silicon wafers are available as substrates. Here is a list of fabrication processes. Make a sequence of the processes so that the expected device can be fabricated. List of processes: *1 point*

I. Thermal Oxidation
II. Lithography
III. Metal deposition
IV. PECVD of silicon dioxide
V. Ellipsometry

- III – II – IV
- I – II – III – IV
- I – III – II – IV
- IV – III – II – I

No, the answer is incorrect.
Score: 0
Accepted Answers:
I – III – II – IV

8) Why argon gas is used in sputtering? *1 point*

- It is an inert gas, so, does not react with target
- It bombards the target
- It can be used as carrier gases for other gases required for the process
- All of these

No, the answer is incorrect.
Score: 0
Accepted Answers:
All of these

9) Silicon-on-Insulator (SOI) is a three-layer substrate that consists of a thin layer of silicon on top of an insulating silicon dioxide; on top of a silicon layer. What are the key advantages of using such a wafer/substrate in device fabrication? *1 point*

I. Reduced Parasitic capacitance
II. More efficient power consumption of devices.
III. Much cheaper than conventional silicon wafers
IV. Reduced antenna effects

- I, II, III
- II, III, IV
- I, III, IV
- I, II, IV

No, the answer is incorrect.
Score: 0
Accepted Answers:
I, II, IV

10) Which of the sputtering techniques gives better yield? *1 point*

- DC sputtering
- Magnetron sputtering
- Co-sputtering
- E-beam sputtering

No, the answer is incorrect.
Score: 0
Accepted Answers:
Magnetron sputtering

11) Why vacuum is created in chamber before thermal evaporation? *1 point*

- To increase the mean free path of the evaporated molecules
- To get a film with more purity
- To prevent oxidation of evaporant metals
- All of these

No, the answer is incorrect.
Score: 0
Accepted Answers:
All of these

12) _____ process can deposit layer with minimum thickness and better precision than other mentioned processes. *1 point*

- Sputtering
- PECVD
- ALD
- E-beam evaporation

No, the answer is incorrect.
Score: 0
Accepted Answers:
ALD