

Unit 5 - Fundamentals of Fabrication Techniques contd...

Course outline

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Week 3 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) Critical feature size of the fabricated device obtained by lithography depends on: 1 point

- Contact dimension
- Line width
- Spacing
- Minimum of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

Minimum of these

2) We use three modes for lithography: contact mode, proximity mode and projection mode. Which statement is false among these? 1 point

- Contact mode cannot support batch production
- Effect of diffraction of light is minimum for contact lithography
- Contact mode gives better resolution than other two modes
- In contact mode, the mask can be contaminated by the photoresists

No, the answer is incorrect.

Score: 0

Accepted Answers:

Contact mode gives better resolution than other two modes

3) _____ used to align wafers with the mask in mask aligner. 1 point

- Linear translation in horizontal plane
- Rotational motion
- Linear translation in vertical direction
- All of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of these

4) Mask aligner is used in fabrication to: 1 point

- I. Coat photoresist on wafer
- II. Align mask and wafer
- III. Expose the coated photoresist on wafer
- IV. Development of the pattern

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

No, the answer is incorrect.

Score: 0

Accepted Answers:

II, III

5) Why split field microscopy is used in mask aligner? 1 point

- I. As dimension of the alignment marks are in μm , microscopes are required to observe those while aligning
- II. Split-field microscopy helps to view the alignment marks from both the microscopes at the same time and helps to align faster
- III. Split field microscopy gives better resolution
- IV. Split field microscopy system is easier to install and does not require any optimization

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

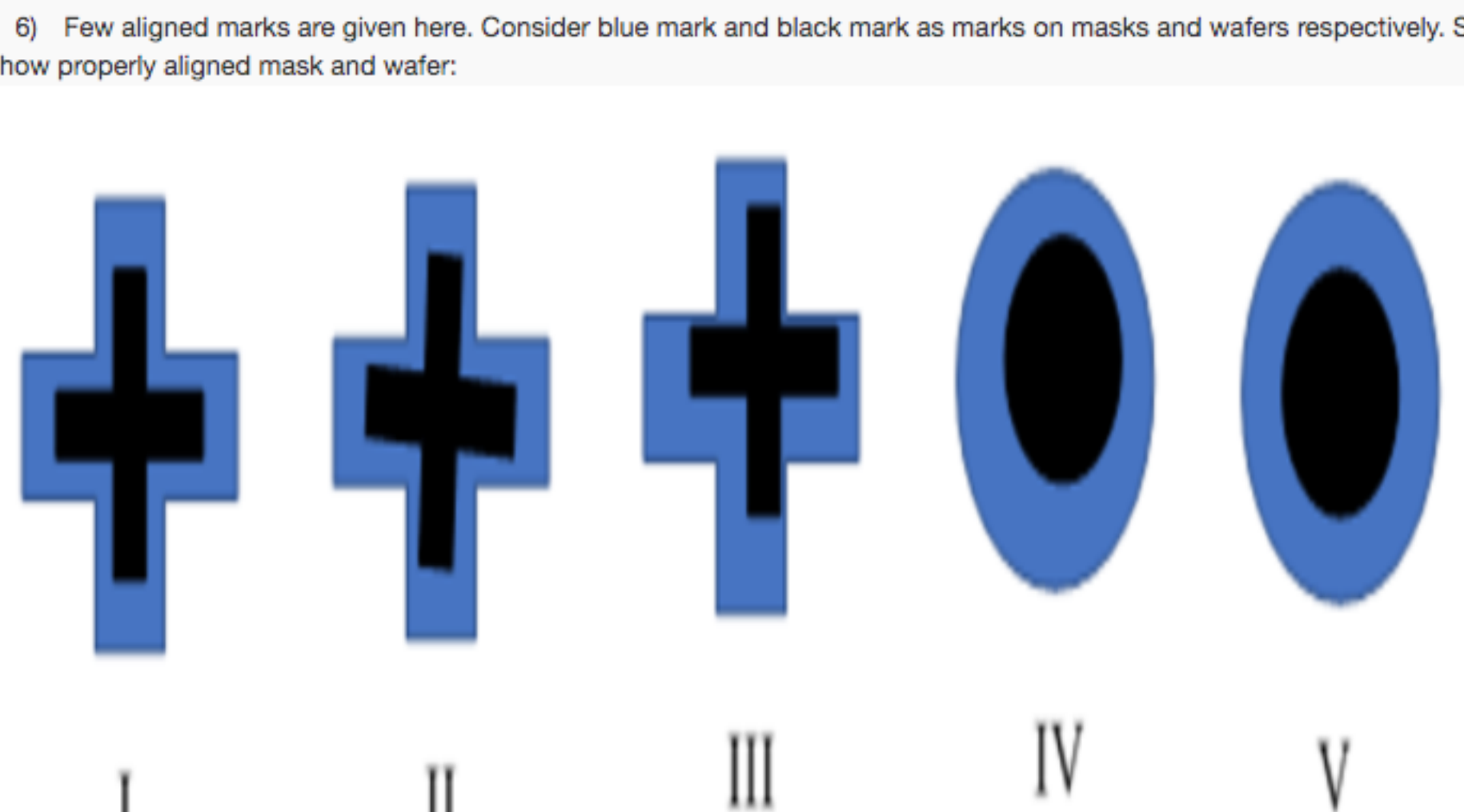
No, the answer is incorrect.

Score: 0

Accepted Answers:

I, II

6) Few aligned marks are given here. Consider blue mark and black mark as marks on masks and wafers respectively. Select the group of marks that show properly aligned mask and wafer. 1 point



- I, III
- I, III, V
- I, V
- I, III, IV, V

No, the answer is incorrect.

Score: 0

Accepted Answers:

I, V

7) Which of the following statement is false for the lift off process? 1 point

- In lift-off process, the coated photoresist is generally removed by RCA clean and HF dip
- Lift off process gives a better result if the bilayer of photoresist is used instead of a single layer of photoresist
- Lift off process is temperature dependent
- Quick evaporation of solvents during lift off may create a problem of redeposition

No, the answer is incorrect.

Score: 0

Accepted Answers:

In lift-off process, the coated photoresist is generally removed by RCA clean and HF dip

8) Which one of the following statements is true for micromachining? 1 point

- The alkaline etchants produce isotropic features after etching of silicon
- Xenon fluoride (dry etch of Si) produces an isotropic feature after etching
- BrF₃ (dry etch of Si) produces anisotropic feature after etching
- All of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

Xenon fluoride (dry etch of Si) produces an isotropic feature after etching

9) After fabrication of any device it is advisable to inspect the devices under microscope before characterization. An array of cantilever is fabricated and characterized. It is found that it cannot meet the expected efficiency. What may be the probable reasons? 1 point

- Cantilever structure may be destroyed in etching
- Cantilever structures may be buckled up due to stress gradient of oxide and nitride layers
- Cantilever structures may not be released properly during removal of sacrificial layer
- All of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of these

10) A layer of silicon dioxide of 1.5 μm is deposited on a silicon wafer. It is patterned with circular structures of 20 μm diameter using photolithography. After development, it is dipped in HF for 1 minute 30 seconds. It was inspected that the depth of pattern is 1.4 μm and diameter of pattern is 22 μm . Determine the anisotropy of this etching process. 1 point

- 0.714
- 0.4
- 0.286
- 1.4

No, the answer is incorrect.

Score: 0

Accepted Answers:

0.286

11) A layer of 1 μm thick silicon dioxide is deposited on a silicon wafer. Deposited layer is patterned using lithography and dipped in HF to etch the layer. Inspection after etching shows 10nm of silicon is also etched with the silicon dioxide layer. What is the selectivity of HF to etch SiO₂, when Si is considered as etch stop layer? 1 point

- 200:1
- 10:1
- 50:1
- 100:1

No, the answer is incorrect.

Score: 0

Accepted Answers:

100:1

12) Non-invasive detection of breast cancer can be performed by detecting the increased concentration of _____ in a breath sample. 1 point

- Methane
- Pentane
- Ethanol
- Acetone

No, the answer is incorrect.

Score: 0

Accepted Answers:

Pentane