1. What is the primary difference between contact printing and projection printing in lithography?

a) Contact printing uses direct physical contact between mask and substrate, while projection printing involves projecting the mask pattern onto the substrate.
b) Projection printing uses direct physical contact between mask and substrate, while contact printing involves projecting the mask pattern onto the substrate.
c) Contact printing has higher resolution than projection printing.
d) Projection printing is only suitable for positive photoresists, while contact printing works with both positive and negative photoresists.

Answer: a) Contact printing uses direct physical contact between mask and substrate, while projection printing involves projecting the mask pattern onto the substrate.
Explanation: Contact printing involves pressing the mask directly onto the substrate, while in projection printing, the mask pattern is projected onto the substrate from a distance.

2. Which technique is commonly used to improve resolution in lithography processes?

a) Proximity printing
b) Direct writing
c) Overlay-accuracies
d) Electron lithography

Answer: d) Electron lithography
Explanation: Electron lithography is a high-resolution technique used to pattern features on substrates with very fine detail, thus improving resolution.

3. What does MEEF stand for in lithography?

a) Maximum Electrical Efficiency Factor
b) Mask-Error Enhancement Factor
c) Minimum Exposure Efficiency Factor
d) Massively Effective Energy Flux

Answer: b) Mask-Error Enhancement Factor
Explanation: MEEF measures the sensitivity of printed features to variations or errors in the photomask.

4. Which type of photoresist is sensitive to UV light and becomes soluble upon exposure?

a) Positive photoresist
b) Negative photoresist
c) Electron resist
d) X-ray resist

Answer: a) Positive photoresist
Explanation: Positive photoresists become more soluble upon exposure to UV light, allowing for selective development of the exposed regions.

5. What is the main advantage of electron lithography over optical lithography?

a) Higher throughput
b) Lower cost
c) Better resolution
d) Compatibility with a wider range of photoresists

Answer: c) Better resolution

Explanation: Electron lithography can achieve much finer resolutions compared to optical lithography due to the shorter wavelength of electrons.

6. Which lithography technique involves directly writing the pattern onto the substrate using a focused beam of electrons or ions?

a) Projection printing
b) Contact printing
c) Direct writing
d) Proximity printing

Answer: c) Direct writing
Explanation: Direct writing involves directly patterning the substrate using a focused beam of electrons or ions without the use of a mask.

7. In lithography, what term refers to the ability to precisely align multiple layers of patterns on a substrate?

a) Resolution enhancement
b) Overlay-accuracies
c) Mask-Error Enhancement Factor
d) Proximity printing

Answer: b) Overlay-accuracies
Explanation: Overlay-accuracies refer to the precision in aligning different layers of patterns on a substrate during lithography processes.

8. Which type of photoresist becomes insoluble upon exposure to light?

a) Positive photoresist
b) Negative photoresist
c) Electron resist
d) X-ray resist

Answer: b) Negative photoresist
Explanation: Negative photoresists become insoluble upon exposure to light, allowing for selective development of the unexposed regions.

9. Which lithography technique uses a mask to project the pattern onto the substrate at a distance?

a) Contact printing
b) Electron lithography
c) Projection printing
d) Direct writing

Answer: c) Projection printing
Explanation: Projection printing involves using a mask to project the pattern onto the substrate at a distance, without direct physical contact.

10. What type of resist is commonly used in electron beam lithography due to its high sensitivity to electron beams?

a) Positive photoresist
b) Negative photoresist
c) Electron resist
d) X-ray resist

Answer: c) Electron resist

Explanation: Electron resist is specifically designed to be highly sensitive to electron beams, making it suitable for electron beam lithography processes.