



**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE – SEMESTER - VIII (NEW SYLLABUS) EXAMINATION- SUMMER 2018**

**Subject Code: 2183901**

**Date: 04-05-2018**

**Subject Name: Nanolithography**

**Time: 10:30 AM to 01:00 PM**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

	<b>MARKS</b>
<b>Q.1</b> (a) Define Positive resist.	<b>03</b>
(b) Explain the chemistry of Acid- Catalysed DUV resist.	<b>04</b>
(c) Write a note on steps involved in adhesion promotion. with a diagram	<b>07</b>
<b>Q.2</b> (a) Define Negative resist.	<b>03</b>
(b) Explain the factors which affect the development of XRL.	<b>04</b>
(c) Explain how X-ray lithography works as a shadow printing technique.	<b>07</b>
<b>OR</b>	
(c) Explain the phenomena of Poisson's spot in lithography.	<b>07</b>
<b>Q.3</b> (a) What does the measurement of residual thickness measurement indicate?	<b>03</b>
(b) Give the historical background for nanoimprint.	<b>04</b>
(c) Explain peeling demolding principle with a diagram.	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) Differentiate between the filling regime and planar regime.	<b>03</b>
(b) Give an account on use of nanoimprint in the 19 <sup>th</sup> century.	<b>04</b>
(c) Explain in detail how fabrication of mould is done.	<b>07</b>
<b>Q.4</b> (a) Define CD Measurement.	<b>03</b>
(b) Explain the concept of local measurement and average local measurement in terms of CD	<b>04</b>
(c) Write a general note on Grating optical diffractometry.	<b>07</b>
<b>OR</b>	
<b>Q.4</b> (a) What are the factors which affect the accuracy measurement in lithography.	<b>03</b>
(b) Explain how measurement reproducibility is important in terms of the CD.	<b>04</b>
(c) Give the principle of Scatterometry and explain the lightning scheme used in it.	<b>07</b>
<b>Q.5</b> (a) Mention the field where CD-SEM and X-SEM where use.	<b>03</b>
(b) Compare X-SEM v/s AFM 3D.	<b>04</b>
(c) Depending on needs explain the various type of lithography techniques in detail.	<b>07</b>
<b>OR</b>	
<b>Q.5</b> (a) Write various techniques used in 1D, 2D and 3D.	<b>03</b>
(b) Give the difference between HRXRL and DXRL	<b>04</b>
(c) Evaluation of morphological damage generated by the primary electron beam from CD-SEM.	<b>07</b>

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